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THE BRITISH EMPIRE

IN THE

NINETEENTH CENTURY



GORDON BROWNE. 21

A STAGE-COACH IN THE OLDEN TIMES.

Vol. iii. p. 137.

A STAGE-COACH IN THE OLDEN TIMES.

One of the most striking changes during the Victorian era is the substitution of the railway for the stage-coach; just as the stage-coach itself was a great advance upon the post-boy system, which it superseded in 1784 when Mr. John Palmer became comptroller-general of the post-office. From that date the mail-coaches increased in speed and numbers until, helped by the new smooth roads created by Telford and Macadam, they reached their highest development about the year 1836. At that time there were fifty-four mail-coaches in England, thirty in Ireland, and ten in Scotland. But soon after 1840 they began to decrease in number, so that about 1860 they were practically extinct. In recent years, however, the demand for stage-coaches for purposes of pleasure has greatly revived in London, and during the summer season the traveller may leave the city by coach for Brighton, Oxford, Guildford, and other places.

THE BRITISH EMPIRE

IN THE

NINETEENTH CENTURY

ITS PROGRESS AND EXPANSION AT HOME AND ABROAD

COMPRISING A DESCRIPTION AND HISTORY OF THE BRITISH COLONIES AND DEPENDENCIES

BY

EDGAR SANDERSON, M.A. (CANTAB.)

AUTHOR OF "HISTORY OF THE BRITISH EMPIRE", "OUTLINES OF THE WORLD'S HISTORY" ETC. ETC.

ILLUSTRATED BY ENGRAVINGS AND MAPS

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OUR EMPIRE
AT HOME AND ABROAD.

BOOK III.—*Continued.*

CIVIL AND MILITARY HISTORY IN THE NINETEENTH CENTURY.

CHAPTER XI.

DOMESTIC EVENTS OF THE CENTURY.—*Continued.*

Mining Disasters—Bursting of the Reservoir at Holmfirth—Inundation of the Sea near Wisbeach—Bursting of the Bradfield Reservoir.

THE people who dwell in a coal-producing country are always liable to be shocked by tidings of calamities mostly invested with a dreadful sameness of detail—the deadened roar of subterraneous explosion due to the ignition of gas from a fiery seam of coal; the column of smoke, with the shattered timbers of the staging at the pit-mouth, shot into the air; the hurried gathering of women and children around the scene of disaster; the cries of anguish that rend the air, as the bodies, brought to bank, are recognized by the wives, the mothers, the sisters, the daughters, and the sweethearts of the dead. Our first instance of colliery-accidents arose from a very unusual cause. On January 16th, 1862, about 10.30 a.m., the beam of the pumping-engine at Hartley Pit, about ten miles north-east of Newcastle-on-Tyne, suddenly broke, from rottenness of the metal, and fell into the shaft, crushing in its fall an ascending "cage". Five men were instantly killed or fatally wounded, and three others were extricated alive. The brattice, or vertical partition dividing the shaft into upcast and downcast for ventilation, was struck by the beam, weighing forty tons, and the whole framework of iron and wood was carried down to the bottom of the

mine. The lower portion was thus cut off, and 215 men and boys were buried. The utmost efforts of rescuing parties could not reach them until six days later, and not one was then alive. Two by two, for some days of mournful work, the bodies were brought to bank. Touching incidents and scenes had occurred during the work of attempted relief. Families of dead men were found lying in groups, children in the arms of fathers, brothers with brothers. The faces of most had the calm expression of slumber. A memorandum in a book taken from the pocket of an "overman" was dated Friday afternoon, the day after the accident, at half-past two. Four men were named as being "took extremely ill". A prayer-meeting had been held, and some of the miners had exhorted their companions in presence of death. The Hartley colliers, as a body, were steady men; there were many total abstainers among them, and some were local preachers and class-leaders among the Methodist communities. Messages to families were found scratched on boxes and flasks. There appeared, in general, to have been perfect calm and peace in meeting death. The funeral-scene at Earsdon, three miles away, on a piece of ground given by the Duke of Northumberland, was very solemn and affecting. One woman had lost her husband, five sons, and a boy whom they had brought up and educated. The relations, in a long procession, followed the many coffins, singing the hymn, "O God, our help in ages past". A letter from the Queen addressed to Mr. Carr, the head-viewer of the colliery, was read by the incumbent of Earsdon at a large religious meeting held on the pit-head. It was dated from Osborne, where the widowed Victoria was lamenting the recent death of the Prince Consort. "In the midst of her own overwhelming grief", she expressed "her tenderest sympathy with the poor widows and mothers", for whom "her own misery made her feel the more". More than £80,000 was raised by public subscription for the relief of about 400 persons who had been dependent on the earnings of those who had perished. Among the most fatal colliery-disasters due to explosion were those at the Oaks Colliery, near Barnsley, in South Yorkshire, in 1866, which destroyed about 360 lives; at the Ferndale Colliery, in the Rhondda Valley, Glamorganshire, in 1867, with a loss of 178 men and boys; and at Abercarn, in the south-west of Monmouthshire, in 1878, when about 300 pitmen perished.

In Great Britain, we have been generally free from serious losses by the inundation of rivers, to which France, Hungary, Spain, and Italy have at divers times been subjected, but on three occasions during the reign of Queen Victoria, water has caused great damage to property and life, or to property alone. The bursting of huge reservoirs was the origin of two of these calamities. In February, 1852, the embankment of the Bilbury Reservoir, above the little town of Holmfirth, in the West Riding of Yorkshire, south of Huddersfield, suddenly gave way. The great receptacle had been constructed in 1838, for the supply of water to the mills in the valley of the river Holme. In 1846, the Commissioners intrusted with the care of the reservoir became, as a corporate body, bankrupt. The engineers and managers declared that the works could not be safe without a lining of puddled clay. This needful operation was never performed. The immediate cause of the catastrophe was, however, the gross neglect of those in charge, who might, at the cost of a few pounds, have put the waste-pit in proper order, and lowered it beneath the level of the embankment. The water burst down with terrific force upon the narrow pass in which Holmfirth stands. The whole contents of the reservoir, 150 yards long, and 90 feet high, swept down towards the plain. Whole rows of cottages went down like cardboard before the rush. Mills, dye-houses, barns, stables, were dashed into ruin. Huge trees torn up by the roots, carts, waggons, and house-wreckage were borne along, and, being stopped in their course by the bridges which spanned a stream in the valley, they formed obstacles behind which the mass of water gathered for a new and overwhelming sweep of destruction. About a hundred lives were lost in the flood. The damage to property was estimated at £600,000, and some thousands of people were left destitute. Large sums of money were subscribed at home and in the colonies for their relief. The coroner's jury found that the disaster was due to the gross negligence of the persons who had been charged with the construction of the reservoir. An inquiry held on the spot showed that one of the commissioners had lived close by the reservoir for six years, and had all the time known that leakages were taking place, and that any unusual strain would bring extreme danger. Neither he nor any of his colleagues could be reached by the existing law.

Ten years later, in 1862, an inundation took place through the bursting or blowing up of a great sluice made for the drainage of the Middle Level between King's Lynn, in north-west Norfolk, and Wisbeach, in Cambridgeshire. About 700,000 acres of the most productive land in the kingdom lay below the high-water level of the Wash, and depended for their safety upon great embankments and self-acting sluice-gates. Four miles south of Lynn was a gate through which the waters of one of the huge drains emptied themselves, at low tide, into the river Ouse, thus passing out to sea with the receding tide, the gates closing of their own accord under the pressure of the rising sea-water. These works had been allowed to fall into disrepair, and the German Ocean, with a spring-tide, came up the river and overthrew the defences. The waters kept pouring through the gap thus made, and, day by day, the floods crept on, covering farm after farm and homestead after homestead, swallowing up flocks and herds, and driving back yeomen-families who had been reduced to pauperism. The sea-water spread over 10,000 acres, and it was long before the skill of engineers could, even in part, remedy the mischief.

The disaster near and at Sheffield in 1864 was far worse than either of those just related. The Bradfield Reservoir, in the hills about seven miles to the north-west of the great seat of the cutlery and other manufactures, was seventy-eight acres in area, and contained nearly 700 millions of gallons of water. The position and formation of this great artificial lake were peculiar. It was almost a natural tank, leaving but little for art to accomplish. The deep valley was stopped at the end by an embankment 500 feet wide at its base, and tapering up to a very narrow apex, while the rear was left open for the free ingress of water, pouring down the sides of the hills in many little streams. On the south side a waste-weir, a foot below the water-line, was supposed to provide for safety under any ordinary circumstances. About nine o'clock on the night of March 11th, a farm-labourer noticed a crack in the embankment. The engineers in charge had just left for the night, but he brought them back. Other signs of danger were soon observed, and an attempt was made to blow up a weir that crossed the dam, and so allow some of the water to escape. The men were laying the charge of powder as the engineer and his assistant crossed the fissure seen by the labourer. The crack suddenly became a chasm, and a

part of the embankment, 110 feet long and 70 feet deep, gave way in a few moments, letting out a tremendous mass of water that, with a terrible roar, rushed down into the valley. Bridges, workshops, rows of houses, were swept away like sand-heaps. As it bore on towards Sheffield, the flood swept off several entire villages, and then, dividing into two streams, devastated the whole district. At a quarter past twelve at night the water reached Sheffield, and soon flooded some of the most populous quarters to the depth of six or eight feet. The streets became rivers in which drowned animals, timber, trees, wrecks of machinery, furniture, and buildings, were carried to and fro. Gas-lamps lay on the pavements below the water. The Midland Railway Station was flooded; shops and cellars were filled with sand and mud. A number of dead bodies were found at Rotherham, about ten miles east of the reservoir. Nearly 300 persons perished in all; the loss of property was beyond calculation. The coroner's jury found that the works had not been constructed with due skill and attention, and that proper inspection had been neglected. Large public subscriptions, headed by the Queen, again provided some compensation for sufferers, and a special Act appointed commissioners to assess damages against the Sheffield Water Works Company.

CHAPTER XII.

DOMESTIC EVENTS OF THE CENTURY (*Continued*).

Visitations of cholera—Rinderpest or Cattle-plague—The fanatic John Thom.—Remarkable trials: Impeachment of Viscount Melville—The "Wager of Battle"—Earl of Cardigan—The Claimant, or Tichborne Case.—Public spectacles: Funerals of Lord Nelson and of Duke of Wellington—Marriage of Prince of Wales—Jubilee of Queen Victoria.—Sovereigns and royal families of the century: George the Third—George the Fourth—Queen Caroline—Princess Charlotte—The sons of George the Third—Frederick, duke of York—William the Fourth and Queen Adelaide—Edward, duke of Kent—Ernest, duke of Cumberland—The Orange Conspiracy—Augustus Frederick, duke of Sussex—Queen Victoria—The Queen's children.

Our narrative now takes us to special visitations of disease affecting human beings and farm-stock. The malady known as Asiatic cholera, prevalent for centuries in certain parts of India, especially in the valley of the Ganges, first made its way almost

throughout the civilized world in the nineteenth century. It was in the early days of 1831, just prior to the political conflict concerning the Reform Bill, that the dread of cholera first arose in the British Isles. It was known that the pestilence, having passed through Central Asia, had reached European Russia. In October, 1831, cholera appeared in Sunderland by importation from the Baltic port of Riga; in February, 1832, it reached London from Hamburg. An outburst of panic arose, largely caused by the elements of utter novelty and ignorance as to the real nature and proper treatment of the plague, and aggravated by the patent facts of its terrible symptoms, its swiftness in destroying human life, and the great and rapid rise in the number of deaths. The disease was then believed to be infectious, and groups of men, assembled at the street-corners discussing the prospects of "the Bill", would break up in haste at the approach of the covered stretchers on which the stricken poor were being carried to the hospitals. The vicious, the feeble, and the diseased were the readiest victims of Asiatic cholera. During its fifteen months' visit to the United Kingdom on this first appearance, the average of deaths was less than one in three of those who were attacked. The lack of accurate registration forbids any attempt to give exact figures concerning the mortality due to this visitation, but the deaths in Great Britain were certainly not fewer than 32,000, and in Ireland they exceeded 21,000. Scientific investigation discovered by degrees that, in the case of Asiatic cholera, care in prevention is far more potent than any efforts at cure, and that purity of drinking-water, and general cleanliness of person and abode, are among the best means of avoiding any attack. During the second British epidemic of cholera in 1848–49, with a far higher population, over 53,000 persons perished from the disease in England and Wales. We have no figures for Ireland and Scotland, but can state that in North Britain seventeen towns were attacked. In 1854 a third assault of the Asiatic disease slew over 20,000 persons in England and Wales. In 1866, the last cholera-epidemic in the British Isles, the malady was almost confined to London, where about 6000 deaths occurred in a population then exceeding 2½ millions.

It was in 1865 that the British farmer, to his grief and loss, became acquainted with the Russian rinderpest or cattle-plague.

This terror of all possessors of horned stock, for which no successful treatment has ever been devised, was brought from the Baltic port of Revel to Hull, at the end of May, in a cargo of cattle. Thence, by railway-transit, the malady spread to London and the south, all through England, and over the Border. In November, 30 English counties, 1 county of Wales, and 17 in Scotland were affected, and before the year closed there were 9753 centres of infection, on farms or in the cattle-sheds of towns, within the limits of Great Britain. More than 70,000 animals, up to that date, had either died from the disease, or had been killed after attack, or slaughtered, in a healthy state, after contact with infected stock, in order to avoid spreading the malady. Orders in Council compelled the adoption of the only safe course, which consisted in the slaughter and prompt burial of all diseased cattle, and of every animal that had been rendered liable to disease by association with those actually stricken. In 1866 an Act enforced the slaughter of all foreign cattle at the port of arrival, and the most stringent measures were adopted for the regulation of the inland trade in stock. The disease gradually disappeared, large sums of public money being paid in compensation to owners who were deprived of healthy cattle by precautionary slaughter in the public interest. The fine pasture-farms of Cheshire had been devastated by this terrible visitation. Beneficial results came in better care for the sanitary condition of farms, and of milk-establishments in towns. Live cattle-markets in London and large provincial towns were replaced by dead-meat markets, with great advantage to public cleanliness, comfort, and health, and a wholly new branch of trade arose in the direct supply of milk by railway from the country to great centres of population, with the consequent closing of the cow-sheds in towns, places which had proved to be prolific contagion-beds of the disease.

A marvellous instance of ignorance and credulity among the agricultural population of Kent occurred early in the year 1838. A lunatic named John Thom, formerly a farmer and maltster living in Cornwall, appeared among the peasantry of the district around Boughton, a village near Canterbury, mentioned by Chaucer in his greatest poem. Under the name and title of "Sir William Courtenay, of Powderham Castle, Devonshire, knight of Malta, king of Jerusalem", &c., he claimed to be a species of Messiah and social

reformer, promising to the farmers land without rent, and abundant wages, or things far beyond wages, to the tillers of the soil. By a mountebank's tricks he persuaded the country-folk of his invulnerability, and of their own immunity from all harm if they followed him. Of his power to work miracles many persons were fully persuaded, and he administered a sacrament in bread and water to his deluded devotees. As he marched about the country, denouncing all laws, and especially the new Poor Law, labourers were enticed away from their work. The law then interfered, and all the folly and farce of Thom's proceedings had a serious and tragical issue. On May 31st, a constable who sought to apprehend the impostor, then at the head of about a hundred men and women, was shot by Thom, who then stabbed his prostrate body with his dagger, and flung it into a ditch. The mob were hurrying to attack Canterbury when two companies of infantry appeared, under the command of Lieutenant Bennett. Thom and his followers withdrew to the shelter of Bossenden Wood, and when the troops drew near to disperse them he shot the officer dead with his pistol. The fanatics then charged with a fierceness so sudden as to cause some confusion among the leading soldiers, but a volley, at close quarters, from their comrades in support, stretched Thom and about ten others lifeless on the ground, while many more were wounded by the fire. Several of the rioters were convicted of murder, but their sentence was commuted to transportation, and some others were imprisoned for a twelve months' term. It was long believed by the more credulous fanatics that Thom, according to his promise, would rise from the dead. With almost inconceivable folly, the clergyman who read the service at the funeral of the maniac omitted the words which relate to the resurrection, lest the delusion of his followers standing near the grave should receive encouragement. The real disgrace lay with the nation and the society that had permitted any members of the body politic to grow up in ignorance so abject and so mischievous almost beneath the shadow of the stately cathedral that forms the ecclesiastical centre of the established faith.

The nineteenth century has produced some of the most notable judicial investigations of all British history. In 1806, the last impeachment in our national records brought to the bar of the House of Lords Viscount Melville, on the charge of "gross malver-

sation and breach of duty" in his former office as Treasurer of the Navy. This able and energetic politician, a devoted follower and friend of the younger William Pitt, is better known as Henry Dundas. The first division in the House of Commons, in April, 1805, on the motion that assailed Melville's character for personal integrity, was only carried by the casting-vote of the Speaker, Mr. Abbott, but the accused man at once resigned his office as First Lord of the Admiralty, and awaited further proceedings. It was in April of the following year that he came before his peers in Westminster Hall. The Whigs, then in power, did their utmost for a conviction, but a majority of the Lords, on the sixteenth day of trial, acquitted the accused statesman. Melville had assuredly been guilty of no more than indiscretion and neglect with regard to the usual official forms in dealing with public moneys.

In 1817, the British public were surprised by a revival of the long obsolete Wager of Battle, or Trial by Combat, which the usage of our ancestors had permitted in civil and criminal cases, as an appeal to the justice of Heaven, tested by the result of a personal conflict between the disputants. The classical instance in our literature is that between Norfolk and Bolingbroke, as given in Shakespeare's *Richard II.*, Act I. Scene 3. In May, 1817, a servant-maid, named Mary Ashford, was found dead in a field at Erdington, a Warwickshire village near Birmingham. Appearances pointed to murder, and Abraham Thornton, a farmer's son and young bricklayer, who had been in her company at a club-feast and dance on the preceding night, was charged with the crime. Tried at the Warwickshire Assizes, in the following August, before Sir George Holroyd, a very learned and sagacious judge, Thornton was acquitted, after evidence for the defence which almost completely cleared him, and even made it doubtful whether Mary Ashford's death were not suicidal. Intense public interest and controversy were aroused, and a sharp local solicitor induced William Ashford, as brother and heir of the deceased girl, to use an old unrepealed statute and proceed against Thornton for an "appeal of murder". The man once acquitted was thus again put on trial for the same offence. He retorted, under legal advice, by the words "Not guilty; and I am ready to defend the same with my body". He then flung down a large gauntlet or glove, for the appellant Ashford to take up, but he declined the challenge, and his counsel

disputed Thornton's right to "wager of battle". These proceedings took place in the Court of King's Bench, at Westminster Hall, before Lord Ellenborough and other judges, who decided, in the end, for Thornton. The "wager of battle" was still refused by Ashford, and the appellee, or person accused under "appeal of murder", was accordingly, and most righteously, discharged. In the following year, 1819, a statute did away with both "appeals" and "wager of battle".

Passing over for the time the unsavoury subject of Queen Caroline's appearance before the Lords in 1820, we come to the last criminal trial in our annals of a British nobleman before his peers. The military career of the Earl of Cardigan, as commanding officer, in succession, of two regiments of Hussars, strikingly illustrates the evils attendant on the old system of "army-purchase", under which men of wealth bought promotion, instead of attaining advancement in the service by seniority, with its necessary concomitant of experience, or by distinguished conduct in the field. Entering the army in 1824, as Lord Brudenell, his father's second title, he bought his way up from Cornet to Lieutenant-colonel in the 15th Hussars, in the course of seven years, by the expenditure of nearly £30,000, and thus, by mere money, acquired the right of holding Englishmen in military subjection. A born bully, tyrant, and martinet, he was wholly unfit to exercise rule over officers or men. His period of command was marked by scandal, favouritism, petty tyranny, and intrigue, and his subordinate officers had to lament both the misery which he could and did inflict upon them, and the glaring notoriety which was thus obtained for their regiment. In 1833, he resigned his command of the 15th Hussars, on the acquittal of an officer whom he had illegally put under arrest. Having strong interest both at Court and at the Horse-guards, he became, in 1836, commanding officer of the 11th Hussars. It is only fair to state that his exertions, combined with a lavish expenditure of his private means, rendered that corps one of the smartest of cavalry regiments. His relations with his subordinate officers were of the most unhappy kind. In frequent quarrels with men of usually mild and gentlemanly character, Lord Cardigan was almost always the aggressor. One of his captains was cashiered for writing him a challenge. To another he sent a very rude verbal message, and then placed him under

prolonged arrest for declining to shake hands with the brother-officer who had been employed to convey the affront. He violated decency by severely flogging a soldier on Sunday, between the services, on the very spot where, half an hour before, the man's comrades had been mustered for public worship. The regiment was, from time to time, before the public in connection with courts-martial either on Lord Cardigan or on some one of his antagonists. At last, the irrepressible peer brought himself within reach of the law of the land. A contemptible squabble concerning the appearance of some wine at the mess-table in a black bottle instead of in a decanter had caused the retirement from the regiment of a certain officer, with the style and title, after he had quitted the service, of Captain Harvey Tuckett. This gentleman then challenged Lord Cardigan, and the duel was fought on Wandsworth Common, near London, then a lonely expanse of grass and furze. Captain Tuckett was shot through the body, the wound happily proving not to be mortal. The victorious peer, with what he probably considered a chivalrous courage, but was in truth the mere insolence of aristocratic bravado, walked off to Wandsworth Police-station, and gave himself into custody. He was put on his trial before the House of Lords, and the British public had then an opportunity of viewing that illustrious body in its judicial capacity, on a matter concerning the person and property of one of themselves. The facts were notorious; the culprit was self-accused. His counsel, Sir William Follett, disputed the identity of the Captain Tuckett who was named in the charge with the person who had received in his body the bullet from Lord Cardigan's pistol. In the exchange of cards prior to the encounter on Wandsworth Common, Tuckett's card bore his full name, which included three Christian names. The peer on trial was asserted to have unlawfully fired at Captain "Harvey" Tuckett. A majority of the peers thereupon acquitted Lord Cardigan, with the usual formula "Not guilty, *upon my honour*". It was noted that the Duke of Cleveland used the words "Not guilty *legally*, upon my honour". The trial had caused a great expenditure of public money, and the result much impressed the public mind.

The most famous combination of civil and criminal proceedings, not merely in the 19th century, but in all British history, is doubtless that connected with the individual called "The Claimant",

and popularly known as "The Tichborne Case". The belief accorded, for a considerable time, by a large number of people not devoid of intelligence and education, to the statements and claims of the greatest impostor of modern times, throws into the shade, in some respects, the credulity of the Kentish clod-hoppers in the case of Thom. Only the briefest summary of the matter can here be given, and we must refer curious readers to Mr. Serjeant Ballantine's book mentioned above, or, for an exhaustive account, to the elaborate summing-up of Lord Chief-Justice Cockburn, which occupied 180 columns of the *Times* newspaper, and was afterwards issued as a 2-vol. book. In the spring of 1854, a slim, fairly-educated, gentlemanly man, twenty-five years of age, named Roger Charles Doughty-Tichborne, was lost off the coast of Brazil, in a sailing-vessel named the *Bella*, on a voyage from Rio de Janeiro to New York. She had foundered at sea with all on board, and not a sign of ship, passengers, or cargo, ever more appeared. Mr. Tichborne was the son and heir of Sir James Doughty-Tichborne, tenth baronet, and head of a family of very long lineage, of good standing in Hampshire before the Norman conquest. Their surname was derived from the river Itchen, at the head of which their possessions lay, being corrupted, in course of ages, from an original "De Itchenbourne". In the modern days with which we are dealing, the title carries with it a fine estate surrounding Tichborne House, about three miles south of Alresford, in Mid-Hampshire. In January, 1867, a very stout man, weighing about 26 stone, of coarse complexion, but with the small hands and feet which are supposed to be often significant of gentle birth, arrived in London from Australia. He appeared in response to an advertisement from Lady Tichborne, asking for news of her long-lost son. That son he claimed to be, with the assertion that, along with eight other men, he had escaped by boat from the *Bella* in 1854, had been picked up at sea, and taken to Australia. He had been living in New South Wales and elsewhere, under the name of Thomas Castro. He claimed the title and estates from Sir Henry Doughty-Tichborne, a minor, son of the Sir Alfred who, on the death of Roger, had become heir as second son of Sir James. A recognition of this claimant by Lady Tichborne, Roger's mother, took place in Paris, but she died before the first, or civil, trial came on, and the precise value of her asserted

recognition was never tested by any form of legal examination. That some resemblance in feature and form, apart from the startling change of bulk, existed between the real original Roger and the claimant of his identity, is proved by the fact that some persons of good position and undoubted integrity, who had known Roger in society, in his cavalry-regiment, and elsewhere, testified that he was, in their full belief, their former friend. Public belief in his story was shown, to a large extent, by investments in bonds on the Tichborne estates, issued by the claimant to raise money for litigation. In May, 1871, an action of ejectment against the occupant of Tichborne House came before the Court of Common Pleas. After 103 days of trial, which cost the estate more than £90,000, the jury found that the claimant was not Sir Roger Tichborne. The evidence adduced was such as to show that he could not be what he claimed to be. In April, 1873, the Claimant was indicted for perjury and forgery, and in February, 1874, convicted on all the counts, he was sentenced to fourteen years' penal servitude. The criminal proceedings cost the country over £60,000, and form a great reproach to our system of jurisprudence in the expenditure of time and money to a needless extent. There are persons (including a lawyer, otherwise perfectly sane, known to the present writer) who are still persuaded that the once-famous Claimant is wrongfully kept from his title and estates. In dismissing the subject of an almost unparalleled display of daring imposture and human credulity, we may state that the trials disclosed the whole process by which the imposture was gradually built up; the acquirement of information needed to sustain the claim advanced; and the manufacture of evidence that would, from the very fact of his existence, have belonged to, and been ready to the hand of, the man who was personated.

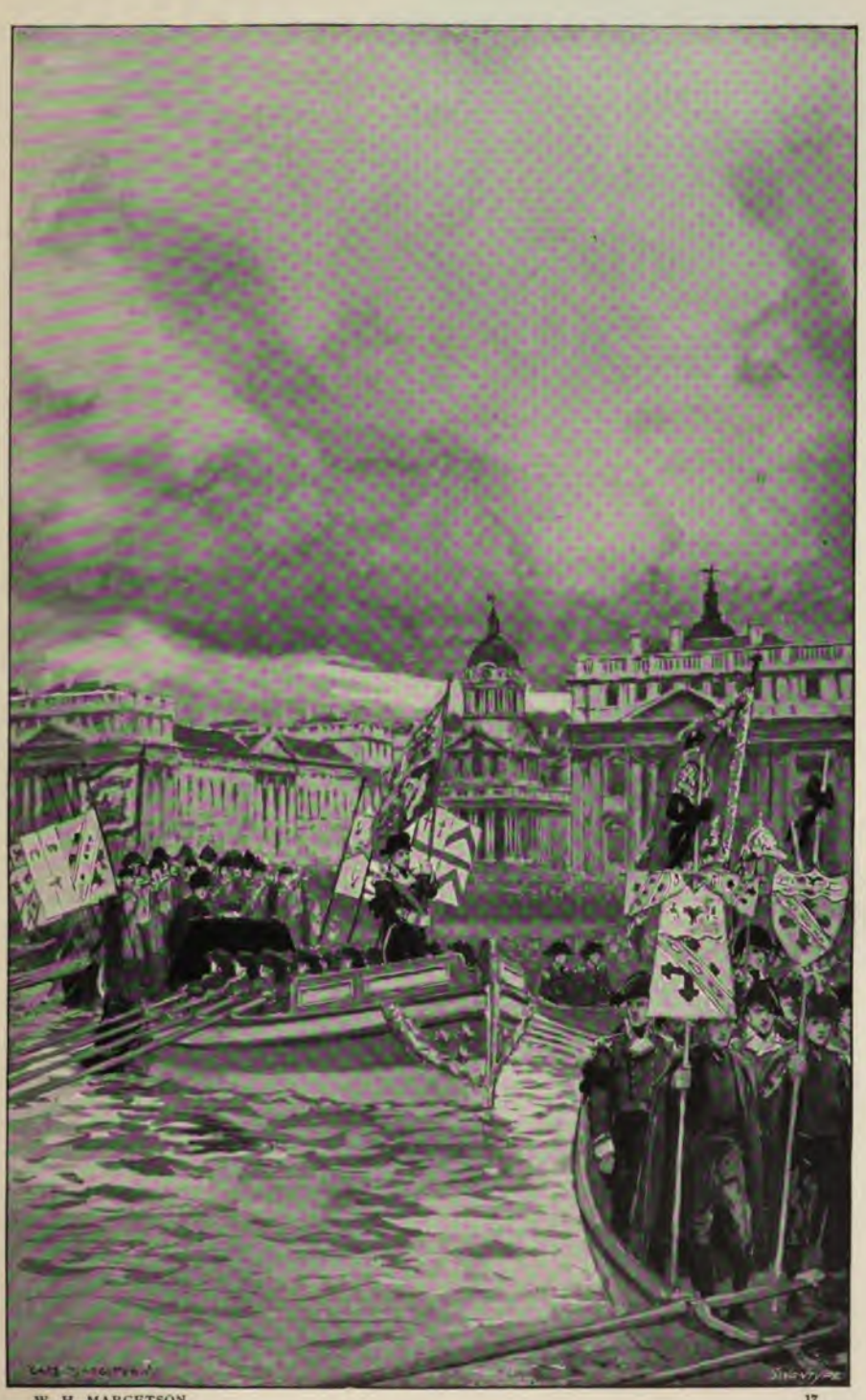
Naval and military reviews, coronations, and royal weddings, with all their pomp and splendour of effect, are beyond the limits of the space at our command, and we can only present a brief account of some of the other remarkable displays, both of a mournful and a joyous character, that have been witnessed within the British Isles during the nineteenth century. The funeral of Lord Nelson, at St. Paul's Cathedral, on January 9th, 1806, was a touching spectacle, marked, as the procession passed on its way, accord-

ing to the testimony of one who was there, by "impassioned grief, audible sighs, tears coursing down rugged cheeks". The leaden coffin, in which his remains had been brought home from the scene of his latest struggle and success, had been cut into pieces, which were distributed, in the words of the *Victory's* chief gunner, "as relics of Saint Nelson". A striking scene occurred in the Cathedral, at the moment when the coffin, covered with his flag, was about to be lowered into the vault. The sailors who stood around, with an irresistible impulse darted forward, tore away the flag, and rent it in pieces, that each might preserve a fragment while he lived. The procession, headed by four regiments of infantry, occupied four hours from the time of its starting until the last coach stopped at the gate of St. Paul's. All the shipping in the river carried flags half-mast high, and the boom of minute-guns from the Tower came on the ear throughout the whole of the bright and calm winter's day. All the seven sons of George the Third were present beneath the dome. In all the long mourning-train, none drew the eyes of spectators more than about three-score men of the *Victory's* crew, bearing two Union Jacks and the St. George's ensign of the famous vessel, these colours showing holes made by the enemy's shot. The procession ended with forty-eight Greenwich pensioners clad in black gowns and bearing black staves.

More than forty-six years had passed away, when another great warrior of Nelson's day went to his rest in the fulness of venerable age, and at a time of European peace, soon to be broken by successive storms of war. "The Duke", as he had long been styled in his pre-eminent position as by far the greatest subject of the Crown, and as the possessor of an imperishable fame in his country's annals, died at Walmer Castle, on the east coast of Kent, on September 14th, 1852. The hero of the Peninsular War and of Waterloo, the honest, devoted friend of his country under four successive sovereigns, ever given to the cause of duty, having long outlived all political mistakes, was universally mourned on his decease amid the mild steady radiance of a glory untarnished by the faintest shadow of personal ambition, meanness, or wrong. A state-funeral, with interment near Nelson at St. Paul's, was at once decreed. That ceremony was preceded by a six-days' lying-in-state at the great hall of Chelsea Hospital, in London, from 11th to 17th

THE FUNERAL OF LORD NELSON.

On the 21st of October, 1805, was fought the famous battle of Trafalgar. The French fleet under Villeneuve sailed out from Cadiz, and Nelson, who had been blockading it, determined to attack at once. Towards mid-day he hoisted the famous signal "England expects that every man will do his duty", while about one o'clock his ship the *Victory* broke into the enemy's centre, sweeping athwart the French flagship and pouring in a terrible broadside. As the *Victory* drove onwards her foreyard became entangled in the rigging of the French ship *Redoubtable*, so that the two vessels crashed together and fought with yard-arm to yard-arm. It was at this point that Nelson, while walking the quarter-deck, was wounded by a musket-shot, and died after three hours of great suffering. His body was preserved in spirits and brought home in the *Victory*. For some time it lay in state in the Painted Hall at Greenwich, and was taken from thence (as shown in the illustration) up the Thames to London, where, amid the lamentations of a whole nation, the great admiral was buried in the crypt of St. Paul's Cathedral.



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THE FUNERAL OF LORD NELSON.

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of November. The whole interior of the stately room was covered with black cloth, the architectural lines of the vaulted roof being picked out with silver cord. Along the side-walls ran a low platform, on which stood Life-guardsmen, with arms reversed, in motionless, mournful, statuesque array. In their front were rows of huge silvered candelabra, bearing lighted wax-candles of enormous size. At the upper end of the hall, a dais, carpeted with cloth of gold, held the bier, hung with Wellington's stars and orders conferred, in his days of war, by the sovereigns of almost every European realm. The coffin was covered with crimson velvet, and the silver balustrade that ran around the bier had projecting pedestals, with black velvet cushions carrying the marshal's batons and orders of Great Britain, Hanover, Austria, the Netherlands, Portugal, Prussia, Russia, and Spain. The first visitor, of all the quarter of a million persons that viewed this imposing sight, was the Queen, who, with faltering steps, advanced as far as the centre of the hall, and then broke into tears, and was led away by her husband, still bitterly weeping, to her carriage.

The funeral took place on November 18th. The memory of that day and that spectacle can never fade from the minds of those who, like the present writer, were permitted to share, with eye and ear, in the sights and sounds of a pageant unsurpassed for melancholy grandeur of effect. At seven o'clock on the gloomy, misty morning, the coffin was raised by machinery to the summit of a lofty funeral-car on the parade-ground behind the Horse-guards, at Whitehall. The vehicle, in its lower part, was wholly of bronze, elaborately worked, and supported on six wheels. Above this framework was a pediment richly gilt, and bearing, on panels, the inscribed names of twenty victories, from Assaye to Waterloo. Trophies of arms, surmounted by ducal coronets and batons, were arranged below the bier, whose velvet pall was powdered with silver embroidery and bordered with silver wreaths of bays. "Blessed are the dead that die in the Lord" was the legend running round, while a fringe of silver, two feet deep, hung below. The coffin bore the Duke's hat and sword, and the whole was surmounted by a canopy with pendent tassels and cords. This superb car, 27 feet long, 10 feet broad, 17 feet high, weighed between ten and eleven tons, and was drawn to the Cathedral, in presence of spectators numbering far beyond a million, by twelve

great black steeds, harnessed three abreast, selected from the splendid teams of notable brewers. At eight o'clock, the hangings of the tent around the car were suddenly furled; the first minute-gun was fired; the troops presented arms; the roll of sound came from muffled drums; and the long procession started to the notes of the Dead March in Handel's grand oratorio *Saul*. It was in a window of the Strand, adjoining Somerset House, that the writer saw the superb display of military pomp that included 6000 troops from every branch of the British army. The funeral-car was, of course, a chief object of attentive gaze, but there were many for whom the most touching sight was the dead hero's charger, with spurred boots reversed, hanging down from the empty saddle, and led along by the special groom that ministered to the wants of the favourite steed. Those who are stirred to their inmost souls by the penetrating power of musical sound can never forget the tones that came from the military bands, artfully arranged so that, as the notes of Handel's march died away ahead, the grand strains of mournful import from Beethoven's *Eroica* Symphony stole upon the ear, swelling higher and higher as the band drew near, to fade away in turn, and be replaced by the wailing sounds from *Saul*.

At the marriage of the Prince of Wales with Alexandra of Denmark on March 10th, 1863, the whole of Great Britain, in the darker hours, was aflame with bonfires on the chief hill-tops of the country-side, and on the headlands by the sea, while the nightly sky was made fantastically bright with the countless sparks from the devices of the skilled artist in fire. By far the most picturesque display of the time was that furnished amidst the fine natural features, and the buildings, ancient and modern, stately, or beautiful, or quaint, of the metropolis of the northern realm. From stem to stern, the huge ship-like ridge, lying between the old town of Edinburgh and the new, was radiant with dancing, glimmering lights from thousands of seeming port-holes. The spire of St. Giles rose up as if studded with rubies and emeralds, and showed out brightly the ancient imperial crown. The dome of St. George's was beauteous with white fire. The Scott monument, the Melville column, the Nelson pillar were arrayed in a garb of brilliant illumination. Arthur's Seat sent forth a ruddy glare that lit up the surrounding heights, and clad the whins and heather in a vesture of gold. Countless variegated lamps and Chinese lanterns gave their

aid to the overwhelming grandeur of the scene, as pillars of fire and jets of parti-hued flame shot up in city and suburb, and rockets, soaring high, burst amid the clouds, and then fell around in glowing showers of sparks. On Salisbury Crags and the neighbouring summit bonfires, like volcanoes, blazed aloft, with tongues of flame twisting and waving in the air; while the Castle on its height presented great terraces of blazing lights, winding in all conceivable varieties of form.

On June 21st, 1887, the Jubilee of Victoria's accession to the throne was celebrated throughout the empire by people of all classes, parties, races, and creeds. Cordial words and precious gifts poured in from every quarter, and the land was given up, amid another blaze of bonfires and pyrotechnic light, to great and universal rejoicings. A grand procession convoyed the Queen, her family, and court from Buckingham Palace to Westminster Abbey, where a thanksgiving service was held before an assemblage of representatives gathered from every quarter of the civilized world, amid a scene of splendour that sparkled with jewels and was rich in every variety of hue and form that costly raiment can furnish in the modern style. The most striking feature of the great pageant on this memorable day was the Cavalcade of Princes, wherein there rode together twenty-four sons, sons-in-law, and grandsons of the British sovereign. The most stately figure in the group was that of the Imperial Crown Prince of Germany, who died, twelve months later, as the Emperor Frederick, shortly after succeeding his aged father, William I., seventh king of Prussia, and founder, in 1871, of the new Germanic imperial realm.

Ten years later, in June, 1897, the subjects of the Crown, in all parts of the Empire, celebrated with fervid loyalty that unique event in our history, the completion of a period of sixty years of rule held by the same monarch. The chief scene of rejoicing was, of course, the heart of the Empire, mighty London, with her five millions of inhabitants swelled in numbers by visitors from the provinces and the colonial dominions, and from foreign countries, to a degree without precedent in British annals.

On Sunday, June 20th, the Queen's accession-day, the morning-service at Westminster Abbey was largely attended by the Peers, while the Commons, also in official array, marched from their

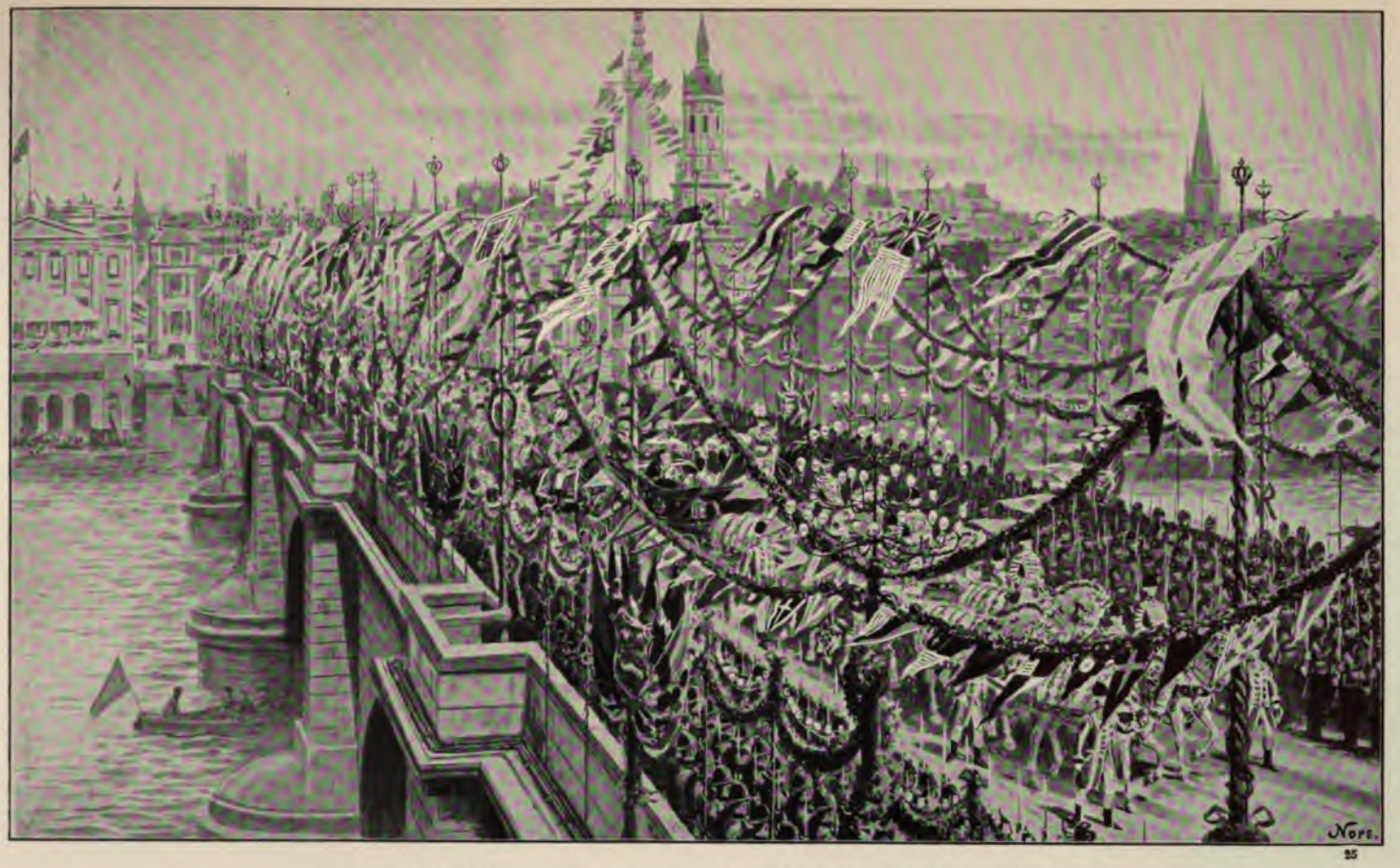
House to their adjacent Parish-church of St. Margaret. The congregation at St. Paul's Cathedral included the Prince and Princess of Wales, and numerous members of the British and of foreign royal families; ambassadors and special envoys; and representatives of learned societies and of many other great institutions. The sermons delivered at these sacred edifices comprised just and lofty eulogies on the merits of the sovereign as a constitutional ruler and as a most noble representative of all the best side of our national life.

On June 21st, the Queen received at Buckingham Palace the Indian princes, the representatives of foreign states, and the eleven colonial premiers—from the seven chief Australasian colonies, Canada, Newfoundland, Cape Colony, and Natal.

The chief ceremony of the whole great festival was the royal procession through London on June 22nd, when the Queen, with the royal family and a brilliant array of royal and other guests and their suites, made a progress through more than six miles of roads and streets, north and south of the Thames. A brief halt at St. Paul's gave time for a most impressive service of thanksgiving conducted on the steps at the great western front of the Cathedral. A scene of enthusiastic loyalty, of vivid and varied colour, and of military pomp rarely equalled, was afforded on this great day. To thoughtful and well-informed spectators, the central figure, the Queen and Empress, was an object of the deepest interest and regard apart from all considerations of the personal character and achievement which were causing so magnificent a display of loyal devotion. In that illustrious personage they viewed one who held constitutional or imperial sway over the largest number of subjects—approaching four hundred millions—that ever, in the whole history of mankind, owed allegiance to the same sovereign. These millions included a greater variety of races, colours, languages, religions, degrees of civilization, and social usages, than could be found in all history among the subjects of the same monarch. The extent of territory ruled by her—about eleven millions of square miles—far exceeded that controlled by any sovereign, ancient, mediæval, or modern. No personage that ever ruled could be more remarkable than Queen Victoria in respect of lineage. Nine different nationalities furnished the strains of blood commingled in the royal line. Ancient British, or Welsh; English;

THE DIAMOND JUBILEE PROCESSION CROSSING LONDON BRIDGE.

The year 1897 is memorable in the history of the British Empire as the Diamond Jubilee year of Queen Victoria. She had reigned for sixty years over her world-wide dominions, and her subjects, in striving to celebrate the great occasion with befitting splendour, were moved by an unsurpassed enthusiasm. The chief ceremony of the festival was the Procession on June 22nd, when the Queen, with the royal family and a brilliant company of distinguished guests from all parts of the Empire, made a Royal Progress through London, both north and south of the Thames. Starting from Buckingham Palace the noble pageant passed along some six miles of streets, crossing the river by London Bridge and Westminster Bridge, thus making a circuit to the point of departure. At St. Paul's the pageant halted while a solemn thanksgiving service was conducted on the steps at the great western front of the Cathedral; and all along the route the Queen was greeted with a mighty outburst of cheering, the spontaneous evidence of that loving loyalty which characterized the attitude of all her people.



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THE DIAMOND JUBILEE PROCESSION CROSSING LONDON BRIDGE

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Norman-French or old Danish; Scottish; German; this extraordinary woman was also Dutch, from Philippa of Hainault; modern Danish, from the wife of James the First; Spanish, from Eleanor of Castile; and French by direct descent from five ladies of high degree, all wives of English monarchs. This most notable of ladies then living, one of the most notable of all time, had also held power, and actually governed, with the full responsibility attached to her exalted position, for a longer period than any sovereign of any important country through the whole course of time. Not Mithridates in olden days; nor Akbar nor Aurungzebe, in modern India; nor any British sovereign, had ever reigned for sixty years. Louis the Fourteenth was king, indeed, for seventy-two years, dating from the day of accession, but the first eighteen years of his reign were passed under the tutelage of his mother and a chief minister.

The real importance, from the imperial and political point of view, of the grand demonstration at this second Jubilee, lay in what concerned the colonial dominions. One of the most picturesque features of the procession was found in the display of colonial troops. A body of fifty mounted men and six officers from New Zealand comprised twenty Maoris of pure descent, the first large number of that famous fighting race that ever set foot in England. These finely-built muscular men were worthy representatives of the most warlike and stubborn people that British troops ever met. Other colonial forces were there in the persons of Canadian troops, Cape Mounted Rifles, Natal volunteers, Zaptiehs from Cyprus, Lancers and Rifles from the Australian colonies and Tasmania; yeomanry from Trinidad, artillery from Malta and Jamaica, Haussas from West Africa; Dyak police from North Borneo; police from the Straits Settlements, British Guiana, and Hong Kong; volunteers from Ceylon. The native Indian Army was gorgeously represented by more than a score of stalwart officers, clad in the scarlet, or blue, or brown uniforms, richly decked with gold, of the Bengal, Madras, and Bombay Lancers, the Punjaub cavalry, and the Hyderabad Contingent; and by troopers from Gwalior, Indore, Bhopal, Jeypore, and many other Indian states.

There was now afforded a striking proof of the fact that the British Empire, during the Queen's reign, had vastly grown in

strength and cohesion by the attachment of self-governing communities who appreciate their freedom. The great Constitutional Colonies of North America, South Africa, and Australasia, absolutely independent as they are in all save the choice of their governors, who have no political power, were represented, as we have seen, at this grand imperial festival of British history, by eleven Premiers of those rising nations, in hearty response to cordial invitations from the Home-government. Loyalty to the one Crown, a golden link of love unfeigned, the only constitutional tie which binds these Colonies to the mother-country, was, in this most significant spectacle of pomp and power, proffered to the august and venerable lady who had, during six decades, acquired the esteem and affection of all her subjects by force of personal character and by the unobtrusive wisdom of her rule. Her reign, indeed, might be justly viewed as the period during which the Colonial Empire attained its real importance. The depth and breadth of British freedom were nobly shown when the rebellious Canada of 1837 was represented in London, sixty years later, by a Premier who was at once a Frenchman in race and a Roman Catholic in religious faith. Australia, almost unknown at Victoria's accession save as a receptacle for convicts, now contained five great free and flourishing communities. No statesman ever foresaw, no historian had ever described, such a wondrous scene of transformation in a colonial dominion as the sovereign had herself witnessed. In slow, and, as it were, unconscious growth and acquisition, the marvellous structure had risen to a strength and integrity very largely due to electricity and steam, the rich fruit of physical science which had so greatly helped union suggested by kinship and affection.

In 1897 it was seen, not merely that the British colonies had not seceded from the home-country, but that the bond had been vastly strengthened since the Jubilee of 1887. Length of reign, apart from the mighty influence of personal character, had exalted our first really colonial monarch from a personage to an institution, a vital element in the existing order of things. The triumphal procession of June 22nd, more glorious than any display in consular or imperial Rome, in that none graced the triumph but those who shared therein of their own free will, proved that every surrender of imperial control on the part of the mother-country had directly led to a growth of imperial power.

At the close of the procession-day, over two thousand five hundred bonfires sent up their flames from conspicuous points in all parts of the British Isles, in token of the universal rejoicing. At the Naval Review of June 26th, more than one hundred and seventy war-vessels of every class, in lines extending five miles from off the new pier at Southsea to a point off Osborne, gave a display of maritime warlike power far exceeding any hitherto seen in the world. Foreign ships of war from all the chief European countries were present to show regard for the British sovereign, manned by those who could well estimate the value of such a British fleet for the defence of the British Empire.

Among the most interesting and instructive demonstrations of this remarkable year were the "Victorian Era" Exhibitions at the Crystal Palace and at Earl's Court, Kensington, illustrative of the progress in arts and sciences made during the long reign. The many philanthropic schemes and works which marked this great occasion included the project entitled "The Prince of Wales' Hospital Fund for London". Started in February, 1897, by a public letter of the Prince, the Fund had received, prior to the great celebration of June, about £20,000 in annual subscriptions, £120,000 in donations, and £20,000 in "commuted subscriptions" for investment. The Princess of Wales, with a thoughtful kindness worthy of one so nearly related to the occupant of the throne, suggested and headed a subscription which, swelled by the splendid donation of £25,000 from an anonymous giver, provided a substantial dinner for about three hundred thousand of the most needy poor of London.

Some account of royal personages, and events concerning them, in the nineteenth century, may fitly close this section of our work. With George the Third, during this period, we have little concern. He had spoilt the effect of the Act of Union in 1801 by his firm opposition to the claims of the Irish Catholics for political freedom. His mind at this time again gave way, but the attack was brief, and Pitt, on resuming office in May, 1804, undertook to renounce his support of the Catholic cause. In March, 1807, George expelled the ministry from office because they refused a promise never, under any circumstances, to propose any concession to the Catholics. The infirmities of age were fastening on the king, who was nearly

blind, and the end of his career as a sovereign was approaching. On October 25th, 1809, the Jubilee of his accession was celebrated with much popular enthusiasm of bell-ringing, bonfires, and feasting in civic halls. The monarch had been always dear to the body of the nation for his virtues in domestic life, and, in the later period of his reign, for his sturdy hatred to Bonaparte and French domination in Europe; and the close of his reign was generally dreaded as the day that would admit to rule his profligate eldest son. That day was not destined to be long postponed. A final shock to his intellect came, at the close of 1810, in the illness and death of his favourite daughter, the Princess Amelia, and he passed into a state of complete mental alienation. Early in 1811, the regal powers of government were assigned by Parliament to George, Prince of Wales, as Regent, and Queen Charlotte received "such direction of the household as may be suitable for the care of his majesty's person, and the maintenance of the royal dignity". The death of the Queen, in November, 1818, transferred the charge of the king's person to the Duke of York, and the closing scene came on January 29th, 1820, when George the Third died at Windsor Castle.

Including the regency, George IV.'s period of rule extended over nearly twenty years, mostly passed in luxurious indolence, with intervals of spasmodic energy when he appeared to be desirous of emulating the position assumed, in his days of mental health, by his laborious and conscientious sire. His mode of life was, now and again, fiercely assailed in the House of Commons by the outspoken recklessness of Brougham, and he had cause to feel dislike for the measure of freedom enjoyed by the public press. His domestic relations with his wife and only child are dealt with below, and we here notice only some of his utterances and actions in public affairs. The Manchester tragedy, or "Peterloo massacre", of 1819, elicited from the Regent an expression to the local authorities of his "great satisfaction derived from their prompt, decisive, and efficient measures for the preservation of the public tranquillity". Under his controlling taste, the architect Nash produced the glories of Buckingham Palace, Regent Street, and the terraces in the newly-formed Regent's Park. A real service to the cause of classical art had been rendered when the prince, in 1815, bought for the sum of £20,000, and presented to the nation, at the British Museum,

the beautiful series of marble-reliefs which once adorned the temple of Apollo at Phigaleia, in the south-west of Arcadia, a province of the Peloponnesus, now the Morea, or peninsula of Greece. These "Phigaleian Marbles", as they are usually styled, representing the combat of the Centaurs and the Lapithæ, are among our most interesting and charming remains of ancient sculpture. In August, 1820, the king's visit to Ireland was marked by the naming, as "Kingstown", of the now important suburb of Dublin. Prior to 1817, when the harbour-works were begun, the place was simply the fishing-village of Dunleary. In 1822, George the Fourth made a voyage to Scotland, landing at Leith on August 18th, where he received a warm welcome as the first sovereign of the House of Brunswick that had ever visited his Scottish subjects. Dressed in the Highland costume, he showed dignity and grace in his receptions held at Holyrood, and gave a pleasant surprise to the Lord Provost at a banquet by proposing his host's health as "Sir William Anderson, Baronet". He afterwards drank to the northern kingdom with the words, "Health to its chieftains! and God bless the land of cakes". He strove his hardest, in his own feeble way, against the admission of the Catholic claims, and uttered strong words against what he deemed to be the revolutionary projects of the Liberals whom he styled "the Jacobins of the world". His death, which occurred at Windsor Castle on June 26th, 1830, from a complication of disorders, was not lamented, and was regarded by the party of progress as opening a new era of salutary reform.

The Princess Caroline, daughter of the Duke of Brunswick, and of Augusta, sister of George III., was married to the Prince of Wales in April, 1795. There was no pretence of affection on the part of the bridegroom, who took his cousin to wife on condition of having his enormous debts defrayed at the public charge. The lady was described by her own father as "wanting in judgment", and Lord Malmesbury, the envoy who arranged the match, wrote of her as one who "with a steady man would do vastly well, but with one of a different description would incur great risks". Her manners and personal habits were such that, prior to the marriage, as he conducted her to England, Malmesbury thought it his duty to advise and to remonstrate "on the toilette, on cleanliness, and on delicacy in speaking". The prince received her with a strange mixture of politeness and disgust, and the life of the wedded pair

corresponded to this inauspicious opening. After the birth of their only child, in January, 1796, the prince abandoned her society, and she lived in retirement at Shooters' Hill and Blackheath, near London. Reports to her discredit caused an inquiry, by the king's order, in 1806, on which occasion the Solicitor-general, Sir Samuel Romilly, a very high authority, reports that "the evidence of all the servants as to the general conduct of the princess was very favourable to her". George the Third, by the advice of the Cabinet, sent her a letter to the effect that while "there was no foundation for the graver charges against her, he saw, with serious concern, evidence of a deportment unbecoming her station".

In 1814, she obtained leave to visit Brunswick, and afterwards to make a farther tour. She visited the coasts of the Mediterranean, and lived for some time at Lake Como in Lombardy. On the death of George the Third, his successor, anxious to avoid her presence in England, offered her an annuity of £50,000, provided she would renounce the title of queen and continue to live abroad. These insulting terms were promptly rejected, in effect, by the queen's arrival, on June 5th, 1820, at Dover, amidst the shouts of the populace. On the evening of June 6th, surrounded by thousands of cheering people, she took up her abode at the house of her staunch supporter, Alderman Wood, of the London Corporation, in South Audley Street. Mr. Brougham, afterwards Lord-chancellor, and Mr. Denman, afterwards Lord Chief-justice, had been appointed as her attorney-general and solicitor-general. The queen thought proper to reject new terms which granted her the royal title and rights, with the use of a royal yacht or a man-of-war, and the due notification of her name and rank at the Court either of Rome or Milan, the capitals of countries in which she had expressed her intention to reside. She insisted upon full recognition and coronation, and in July the ministers, reluctantly yielding to the king's wish, brought in a Bill of Pains and Penalties which, on the ground of her alleged misconduct and infidelity as a wife, sought to deprive her of her regal title, prerogatives, privileges, and rights, and to dissolve the marriage between her and the king.

On August 3rd, the queen took up her residence in Brandenburgh House, at Hammersmith, in London, and for four months was the object of popular ovations. The *John Bull* newspaper was

started by the famous wit and diner-out, Theodore Hook, for the express purpose of vilifying the accused lady, while violence and ribaldry were poured out, from the other side, against the king and his partisans in this unseemly strife, one without parallel in all British history. The scenes presented in the House of Lords during the investigation were often most exciting. A chair of state was placed for the queen, outside the bar, and fronting the throne and the woolsack. On August 21st the appearance, as a witness against her, of Teodore Majocchi, one of her domestic servants in Italy, aroused the indignant surprise of the accused lady, who turned suddenly round, uttered a loud cry, and rushed from the House. She was, it is fairly supposed, disgusted by the ingratitude of one whom she had always kindly treated. She had, assuredly, nothing to fear from his evidence, which was so ludicrous in its palpable falsehoods and suppressions that the man became a standing joke. Brougham and Denman conducted the defence with the utmost keenness, acuteness, and daring. One of the king's brothers was denounced to his face as a slanderer, nor was the sovereign himself spared covert but unmistakable insult in a reference to the history of imperial Rome, which dealt with Nero's conduct towards his innocent wife Octavia.

The second reading of the Bill against the Queen was carried only by 123 votes against 95, and the majority was still smaller when the penalty of divorce was brought into consideration. On November 10th, the majority for the third reading was only nine, 108 to 99, and the ministers thereupon abandoned the whole procedure, to the general joy. The present writer, after a careful perusal, with an open mind, of the whole of the evidence adduced in this memorable case, feels constrained to adopt the general opinion that Queen Caroline was not guilty of the charge brought against her, but that she laid herself open to grave and reasonable suspicion by imprudence and indecorum. She did not long survive her trial. Her popularity waned with her acceptance of an annuity of £50,000 from Parliament, after her declaration that she would take nothing till her rights as queen were acknowledged. In July, 1821, the Privy Council decided against her claim to be crowned along with the king, but she persisted in trying to enter Westminster Abbey, on the day of the ceremony, only to be met, at every entrance, with a humiliating rebuff. On August 7th she

found rest in death, but popular feeling caused a riot at the departure of her funeral-train from London, on the way to Harwich, for embarkation of her remains, which were to be interred at Brunswick. The Life-guards were attacked at Cumberland Gate, on the north side of Hyde Park, and two of the mob were shot, but the people carried out their purpose of escorting the hearse through the City, with the Lord Mayor at the head of the procession.

The death of this hapless lady's daughter, the Princess Charlotte Augusta, occasioned wider and more heartfelt grief throughout the British nation than any decease of a royal personage for ages had caused. She was the centre of a nation's fondest affection and hope. Bright, lively, and warm-tempered, brought up carefully in strict seclusion, she was betrothed, at eighteen years of age, in December, 1813, to Prince William of Orange, but she showed her spirit by soon breaking off this projected match in defiance of her father's wishes. She was married, in May, 1816, in an union of perfect love on both sides, to the accomplished and excellent Prince Leopold of Saxe-Coburg, afterwards the admirable first king of the Belgians. She was regarded as a future true patriot queen, whose public duties as a constitutional sovereign would be amply fulfilled, and whose tastes, habits, and virtues would at once adorn the throne and promote the highest well-being of society. The married pair were living a happy and quiet life, surrounded by public regard and esteem, when, "without the slightest warning, without the opportunity of a moment's immediate preparation, in the midst of the deepest tranquillity, at midnight a voice was heard in the palace, not of singing men and singing women, not of revelry and mirth, but the cry, 'Behold, the Bridegroom cometh'". These solemn and affecting words, from the funeral sermon preached by one of our noblest Christian orators, the Baptist minister, Robert Hall, well befit the mournful occasion of their utterance. It was on November 6th, 1817, at Claremont House, in Surrey, that Charlotte of Wales passed away into the light of another existence, with the infant to whom she had given birth. The nation was plunged into deep and universal sorrow. The blackness of garb that was everywhere beheld was, for once, the symbol of something far more than official mourning. There were few firesides where tears did not fall for the people's and for the bereaved husband's loss, whom the language of heartfelt sympathy often spoke of as "poor man" and

"poor fellow". It was well for the British people that Providence had in store, yet unborn, another princess whose benignant and most constitutional sway should realize in full measure the hopes that had gathered, twenty years before, round the life of the kinswoman whose sun "went down while it was yet day".

Taking the sons of George the Third in order of birth, we come, after George IV., to Frederick, Duke of York. We have seen something of this royal personage's incapacity in the Netherlands as commander of British forces against the French. As commander-in-chief, he found his proper sphere of duty in directing military affairs at the Horse-guards, where he proved himself to be a diligent and sagacious man of business in many respects, and won real honour by the improvements which he introduced into the service, and, especially, by the kindly consideration for the interests of the privates which won him the title of "the soldier's friend". It is for these merits, we presume, that the tall column erected to his memory still looks down upon the parade-ground of the Horse-guards and the verdure of Saint James' Park. The duke was tainted with the profligacy of the times, which the king's good example was unable to restrain, and he thereby incurred grievous reproach in his official capacity. A parliamentary inquiry, promoted by the Radical leaders, Sir Francis Burdett, Lord Folkestone, and Mr. Whitbread, and occupying the House of Commons for nearly two months, proved that the commander-in-chief had allowed his mistress, Mrs. Clarke, to influence him in the bestowal of army-commissions and other offices. It was not proved, except by the shameless woman's own hostile testimony, that the duke had any knowledge of her sale of such offices. A majority of the Commons, 278 to 196, freed him from the imputations of "personal corruption, and connivance at corruption", but the large minority included such distinguished Whigs as Lord Henry Petty (afterwards Marquis of Lansdowne) and Sir Samuel Romilly, with the eminent and spotless Tory, William Wilberforce. The duke, in consequence, resigned his post as commander-in-chief, but was re-instated in 1811, and continued to act for the good of the military service, without a renewal of the former scandals. In 1825, the Duke of York became, from a speech in the House of Lords, a most conspicuous opponent of the Catholic claims, and his words, as those of the heir-presumptive to the throne, had much influence in pro-

ducing the large majority by which the peers threw out a measure in favour of the Catholics which had just been carried in the House of Commons. The Duke of York had been married to the eldest daughter of the King of Prussia, but his death, in 1827, found him devoid of legitimate heirs, and the throne accordingly passed, in 1830, to the old king's third son, William, Duke of Clarence.

The history, before reigning, of William the Fourth, is in some degree connected with the British navy. We find him serving as a midshipman, in 1780, on Lord Rodney's fleet which relieved our brave garrison at Gibraltar from imminent starvation, and we read of a Spanish admiral's admiring surprise when he found the British sovereign's son obeying orders like any other petty officer. "Well does Great Britain merit the empire of the sea!" was the friendly foeman's comment, as a prisoner of war, on our naval discipline. When he attained a rank in the service which enabled him to command a ship of his own, he was not conspicuous in setting an example of devotion to duty. He twice quitted a foreign station without leave, and was leniently dealt with in being confined to harbour at Plymouth for as long a time as that of his absence from his proper post. Withdrawing from the active exercise of his profession, he lived quietly ashore for twenty years, rising in naval rank by the regular gradations until he was appointed, in 1827, to the revived office of Lord High Admiral. Debarred, by the Royal Marriages Act, from selecting a wife according to his own taste, he lived from 1790 till 1811 with the charming Irish actress, Mrs. Jordan, who, in spite of her name, was really a single woman. The fidelity of the lady, and the long-continued attachment and respectful behaviour of the prince, her virtual husband, gave a character to this connection which caused the ten children, five sons and five daughters, to be received in good English society with a freedom rarely accorded under such circumstances. When he became king, William created the eldest son Earl of Munster, by one of his own former titles, and gave to his other illegitimate offspring, the Fitzclarences, the rank and precedence of the younger sons and daughters of a marquis.

In 1818, the Duke of Clarence married the German princess Adelaide of Saxe-Meiningen, whose only two children, daughters, died in very early infancy. This excellent lady, known for twelve years as "the Queen-Dowager", won the deepest respect of the best part of the nation by her gentle, womanly virtues, and by the

sincere and humble piety of her character as a Christian, in which she merged all the claims of earthly rank. Dying in 1849, she left directions, "in one of the most touching and unaffected documents that ever went right home to English hearts", that her mortal remains should be carried to the grave, without any pomp or state, in St. George's Chapel, Windsor, "by sailors". In his character and actions as king, William the Fourth has been already seen. He was a kindly man, one of mingled virtues and faults, like most human beings, one of whom we may say that it had been well for nations if no worse a monarch had ever sat upon a throne. His death at Windsor Castle, on June 20th, 1837, brought his niece Victoria to the position of queen.

The fourth son of George the Third was Edward, Duke of Kent. This blameless prince, of benevolent character and popular demeanour, had held, with high credit and esteem, military commands at Gibraltar and in Canada, where he gave his name, in 1799, to Prince Edward Island. In July, 1818, he was married to Mary Louisa Victoria, daughter of the Duke of Saxe-Coburg-Saalfeld, and sister of Prince Leopold, widower of the lamented Princess Charlotte. The lady was widow of the Prince of Leiningen. On May 24th, 1819, the Princess Victoria, destined to succeed to the throne in 1837, was born. Eight months later, in January, 1820, her father met his death through his own lack of prudence in regard to health. Gifted with a robust constitution, he had braved, in his habit of regular exercise, the pelting rain of a wintry morning at Sidmouth, in Devonshire. On his return with wet boots, he neglected to change them, and remained for some hours petting his little daughter. A chill supervened, fever set in, and in three days he was dead, just six days prior to his aged father's decease at Windsor. The care of the little Victoria devolved upon her mother, and it is well known that the trust was admirably fulfilled, as regards the training both of intellect and character. Prudence, economy, method, courage, self-reliance, and a full acquaintance with the prerogatives and duties of that highest position which, as years rolled on, came full in view of the youthful princess, had all their proper share of attention from her mother, and from the tutors and the female instructors who were selected for duties so important to the chief person concerned, and, as it proved, to the British nation and empire.

The fifth son of George the Third was Ernest, Duke of Cumberland, a man who became thoroughly hated by the bulk of the nation. In political affairs his principles were most repugnant to the spirit of the age. His private character is mildly described by the assertion that it did not command esteem. His chief claim to a place in history, or notoriety, apart from his odious tyranny as King of Hanover, is derived from his connection with a somewhat dangerous conspiracy against the claims and rights of the Princess Victoria. The matter has by no means received from historians the amount of attention which it undoubtedly deserves. It is impossible to enter here into lengthy details. The duke had always been a stout opponent of measures of reform in Church or State, and his hostility to the Catholic claims for political freedom brought him into alliance with the Orangemen, or ultra-Protestants, of northern Ireland and Great Britain. In 1828, he became Grand Master of all the Orange lodges on both sides of the Irish Channel. These associations numbered, at last, within the British Isles, far more than a quarter of a million members, and, besides some thousands of Orangemen enrolled in Canada, there were lodges among the troops at Malta, Gibraltar, Corfu, Bermuda, and Australia. A system of secret signs and passwords existed, and all the members were prepared for absolute obedience to the orders of the Duke of Cumberland. The Orangemen were exasperated by the Act of 1829, admitting Catholics to Parliament and to most public offices, and a conspiracy was formed for the exclusion of the Princess Victoria from the throne, if it should come to her, from lack of heirs of William the Fourth, and for the succession, in her stead, of the Duke of Cumberland. That royal personage had appointed a certain Lieutenant-colonel Fairman as his deputy, with power to establish Orange lodges wherever he could. It is not likely that the nation would have permitted anything so absurd, but there was a measure of risk in the fact that thirty Orange lodges existed in the army quartered at home. Fairman proved to be a very energetic, if not a very wise, promoter of this plot. One of his suggestions, which excited peals of laughter outside the Orange lodges, was that there was danger lest, on the death of George the Fourth, the Duke of Wellington should seize the throne for himself. To those who know the man and his career, this idea must present the very quintessence of unreason.

There were, in the House of Commons, men with wit to discover and courage to unmask these treasonable schemes. The distinguished Irish members, Daniel O'Connell and Richard Lalor Sheil, and the sturdy Scottish Radical, Mr. Joseph Hume, in March, 1835, persistently questioned the ministers concerning certain Orange addresses to the king, and public attention was thus drawn to the matter. It was the energy and intelligence of Mr. Hume that were chiefly instrumental in disclosing the conspiracy. A Parliamentary committee of inquiry was appointed, and that committee found that Fairman had striven to enlist people in support of the treasonable movement. They also rejected the statements of the Duke of Cumberland and of Lord Kenyon, one of his chief supporters, as to their ignorance of the fact that an Orange organization existed in the army. The Bishop of Salisbury, many lay peers, and many clergymen of the Established Church, were connected with this half-ludicrous, half-monstrous plot, which was really killed by the light of publicity thrown upon it. Lord John Russell, as Home Secretary and leader of the Commons in Lord Melbourne's second ministry, treated the affair with much prudence, moderation, and courage. The Duke of Cumberland received a hint to withdraw himself from all connection with the Orange lodges, and, when he neglected this suggestion, he was censured in the Commons by Lord John Russell. The king, William the Fourth, in reply to an address from the Commons, promised the utmost vigilance and vigour in suppressing political societies in the army. Colonel Fairman, threatened with committal to Newgate for disobedience to an order of the Commons Committee, vanished from the scene. The Government resolved to prosecute the Duke of Cumberland, Lord Kenyon, the Bishop of Salisbury, and other persons in the Central Criminal Court, but the chief witness, an Orangeman who had taken fright at Fairman's incitements to treason, died a few days before the trial was to come on. In February, 1836, Mr. Hume moved a very strong resolution in the Commons against Orange associations, but Lord John Russell proposed, and carried unanimously, a milder course in an address to the king, praying him to take effectual measures for the suppression of the Orange societies. The Orangemen in the House were by this time cowed. The Duke of Cumberland, as Grand Master, then informed the Gover-

that he had recommended the dissolution of Orange societies in Ireland, and that he should at once dissolve all Orange clubs elsewhere. Thus ended the Orange conspiracy against the succession of Victoria, and it was for this plot, amongst other reasons, that the British public, in 1837, were very glad to see the departure of Ernest, Duke of Cumberland, when he became King of Hanover.

The most popular of all the male progeny of George the Third, full of grace and kindness at his father's court in his earlier years, was the sixth son, Augustus Frederick, Duke of Sussex. By his benevolence, his name is honourably connected with one of the chief London hospitals in the "Sussex wing", an extension erected at his cost. He was, in mid-life and in his later days, known as an amiable man, a lover of philosophy and books, and he died in April, 1843. The youngest son, Adolphus Frederick, Duke of Cambridge, married, in 1818, the Princess Augusta of Hesse, and left, at his death, in 1850, a son, George, afterwards for many years Commander-in-chief, and two daughters, the younger being the popular Mary Adelaide, afterwards Duchess of Teck.

The life and character, both public and private, of Queen Victoria and her husband, Prince Albert of Saxe-Coburg-Gotha, are abundantly known from a mass of books that appeared in the Jubilee-year, from the Queen's own published writings, and from the *Life of the Prince Consort* due to the pen of Sir Theodore Martin. The death of the prince at Windsor Castle, from typhoid fever, on December 14th, 1861, was a great and irreparable loss both to the sovereign and to the British empire. As it often occurs with men of special worth, his value was only understood when he was for ever lost to this lower sphere of human activity. His life was one of spotless virtue, and, after his marriage, of absolute devotion to the interests and well-being of his wife and sovereign, and of the nation which she ruled.

It is needless to dwell on the marriage connections formed by the Queen's children. The tragical, or nearly tragical, events that have affected the royal family may be here recalled. Ten years after the death of the Prince Consort, the Prince of Wales, in December, 1871, all but fell a victim to the same malady. It was on the 14th, almost at the same hour as that of his father's death, that the son began to amend. On February 27th, 1872, his complete recovery was signalized by his attendance with the Queen

and the Princess of Wales at a solemn service of thanksgiving held in St. Paul's Cathedral.

The Queen's second son, Prince Alfred, Duke of Edinburgh, in 1868 narrowly escaped assassination at the hands of a man who was said to belong to the Irish Fenian organization. He was visiting Sydney, the capital of New South Wales, in his frigate, the *Galatea*, when, on March 12th, at a place called Clontarf, as he stood amidst a crowd that included the Governor, the Chief-justice, and other distinguished persons, a miscreant named Farrell raised a revolver, and, with deliberate aim, fired a bullet into the prince's body. The stricken man fell forward on his hands and knees, exclaiming that his back was broken. Sir William Manning, a member of the Legislative Council, rushed at the man, who pointed the revolver again, causing Sir William to stumble and fall in his effort to escape the second shot. The trigger, however, failed to act, and a third attempt sent a shot into the ground just before Farrell's hands were seized and his arms pinioned by a by-stander. It was found that the prince had been struck just behind the right ribs, and that the ball had passed over them and lodged, not deeply, in the muscles of the abdomen. There was much loss of blood and painful suffering, but no serious danger, and recovery from the wound was fairly rapid. The duke, on quitting the colony, interceded for his would-be-murderer, but the man was very properly tried, condemned, and executed as a salutary example to such cowardly, purposeless villains.

In December, 1878, the Queen's second daughter, Princess Alice, married to the Grand-duke of Hesse-Darmstadt, in Germany, died from diphtheria caught in close attendance upon one of her children who was expiring from that malignant disease. In March, 1884, the Queen's fourth and youngest son, Prince Leopold, Duke of Albany, died suddenly at Cannes, in the south of France, from a fit of epilepsy. Always of feeble health, he resembled his father in tastes and character, and the nation had hoped for good work from his efforts in the line of social and artistic improvement.

Another loss was suffered in the reigning house of Great Britain through the premature death of the Prince of Wales' eldest son, Albert Victor, on January 14th, 1892. At twenty-eight years of age, in the direct line for succession to the throne, he succumbed to an attack of inflammation of the lungs. [illegible] y been

betrothed to his distant kinswoman, the Princess Mary, daughter of the Duke and Duchess of Teck. This lady, in July, 1893, married the deceased prince's younger brother George, Duke of York. Some later events connected with the royal family of these realms may here be briefly stated. At the close of 1893, the Duke of Edinburgh became a minor continental sovereign by his accession to the dukedom of Saxe-Coburg Gotha, in Germany, as heir of his uncle, Ernest II., brother of the Prince Consort. In June, 1894, another heir to the throne, in the direct line of succession, was provided in the birth of a son to the Duke and Duchess of York, and a second son of the same parents was born in December, 1895, and a daughter in April, 1897. Among marriages in the royal family, we may note that, under Queen Victoria, personages of the blood-royal have in three instances been permitted by the sovereign, according to the Royal Marriage Act of 1772, to wed non-royal subjects of the Crown. In 1871, the Queen's fourth daughter, Princess Louise, married the Marquis of Lorne, eldest son and heir of the Duke of Argyll. In 1889, Princess Louise, eldest daughter of the Prince and Princess of Wales, became Duchess of Fife, and in 1895, Prince Adolphus, eldest son of the Duke and Duchess of Teck, was united in marriage with the Lady Margaret Grosvenor, daughter of the Duke of Westminster. The royal house of Great Britain is distinguished, in this last decade of the nineteenth century, by the unequalled length, in our history, of Victoria's reign, and by the copious supply of heirs, in direct and collateral lines of succession, for the throne which, in the life and person of its latest female occupant, has been truly one "established by righteousness".

BOOK IV.

HISTORY OF BRITISH PROGRESS IN THE NINETEENTH CENTURY.

CHAPTER I.

EVIL THINGS AMENDED OR PASSED AWAY.

Political corruption of the past—Sir Arthur Wellesley—Bribery at elections—Voting by ballot—The Corrupt Practices Acts—Bull-baiting—Societies for prevention of cruelty to animals established—Prize-fighting—The Rebekahites in Wales—Abolition of tolls on roads—Duelling—Pressgangs—Prevalence of smuggling—Lotteries—Lucifer matches and paraffin candles supersede the miseries of the tinder-box and snuffers.

Political corruption is a mischief that will probably never disappear while man continues to be a political animal, but in these latter days of the nineteenth century we may claim to have made great advances since the time when George the Third was king. Let us glance for a moment at Irish administration under one of the most honourable men of his own or of any age, and we shall be able to form some conception of the political jobbery and robbery that were rife in the days of an unreformed House of Commons. Spotless in his personal character for manliness and integrity, the Sir Arthur Wellesley who was to immortalize the title of "Duke of Wellington" was in no wise ahead of contemporary morality in dealing with political affairs. The thorough devotion to duty of this illustrious man became, in this respect, the "fountain and birth of evil". Actuated by the principle that the king's service must be carried on in some way or other, this man, in all else so noble-minded, made free use of gross bribery. From March, 1807, till April, 1809, Sir Arthur, with two intervals of military service, was Chief Secretary for Ireland, under the Duke of Portland as premier. The state of Ireland was then deplorable. The ministry was pledged to George the Third not to countenance the Catholic claims. The wounds inflicted on the body politic in the rebellion of 1798, and in the withholding, at the Union of 1801, of the religi- political

freedom promised as the price of Catholic support to that measure, were still open and festering. The Orangemen were struggling hard to retain, in Church and State, the ascendency which they had long held to be their birthright. The lower and middle classes were thoroughly disaffected, and were eagerly longing for a foreign invasion. The violence of the Parliamentary opposition at Westminster increased the difficulties of the government in England, and it was needful to maintain, by all means at command, a strong majority in both Houses. To this end material assistance was given by the unscrupulous exercise of patronage in Ireland, whose separate executive establishments abounded in very light duties combined with very heavy salaries. In order to dispel any doubt as to the correctness of the statements now to be made, we may premise that the whole evidence, as regards Sir Arthur Wellesley, is derived from his own civil correspondence and memoranda, where it is furnished with a frankness characteristic of the man. In plain English, he plunged over head and ears in the mire of Irish corruption, and very Irish and very corrupt it was. We find him writing to a lady to ask her what he could do for her if she would undertake to support the new Ministry. The lady, who was clearly a patriot of experience, refers in her reply to previous disappointments (not from Sir Arthur), and declares her intention, until something tangible is given, of "acting to the best of her judgment for the benefit of the Empire, and of Ireland in particular". The next letter to this is a reply of Sir Arthur's, with respect to certain demands of a truly modest applicant. This gentleman named, and obtained, as the price of his support—an Irish peerage for himself; the entire patronage of his county for himself and a friend, with a seat in the Privy Council for each; a legal office for another friend; a staff-appointment for a third; a pension for a lady in whom the applicant was interested; and immediate promotion in the army for a certain Captain Bailey. It reads like a joke, but it is absolutely true, on the testimony, against himself, of one of the most truthful men that ever lived in the world. A long correspondence ensues between Sir Arthur and the government in England on the most effectual mode of securing Irish seats in Parliament. He writes to the Secretary to the Treasury in London:—"Lord Enniskillen told me you might recommend to his seat at Enniskillen. He will, however, expect

its value. ——'s seat at Dundalk might be had; as he prefers his brother's claim to a bishopric, he ought not to be suffered to sell. I have written to Henry about a seat for myself. I should not, of course, like to pay much money for one. Tell Lord Palmerston [this is the subsequent premier] to give me his interest for Sligo, and desire his agent, Henry Stewart, to do as I order him. . . . If Mr. Croker succeeds, he will have to vacate an office of £300 a-year, which will revert to Government, and will serve to bribe somebody else." The cool, business-like simplicity of these electoral arrangements, in the letter of such a man, reveals to us the state of political corruption. The whole correspondence has no word of comment on the baseness of the people with whom he had to deal, nor of reluctance to making himself an instrument in perverting to party-ends the institutions of the land, nor of regret at the enormous and systematic evil in which he took the lead. Having assumed the post of Chief Secretary, and found one of its duties to be that of corrupting as many constituencies, and debauching as many members of Parliament, as the means placed at his disposal would allow, Sir Arthur Wellesley addressed himself to the task with the same grave and deliberate energy as he afterwards more worthily displayed in the organization of armies, the winning of battles, and the attainment of imperishable renown.

If such were the conduct of a member of the Government, not much was to be expected from most of those who voted at parliamentary elections. Electoral contests for seats in the House of Commons were, in that age and for long afterwards, scenes of outrageous violence, drunkenness, and bribery. County elections extended over fifteen days. The most expensive contest on record was that in 1807 for the county of Yorkshire, when Mr. Wilberforce, the great supporter of freedom for slaves in the British Empire, was opposed by Lord Milton, eldest son of Earl Fitzwilliam, and by the Hon. H. Lascelles, son of the Earl of Harewood. When Wilberforce reached the scene of action, after having represented Yorkshire for twenty-three years in successive parliaments, he found that his adversaries had secured houses of entertainment and all kinds of conveyances in every considerable town. Within a week, over £60,000 was subscribed to defray his election expenses, and, after a contest during which nearly half

a million of money was squandered, the illustrious Abolitionist leading the poll.

The evil of bribery displayed in the open or covert exchange of votes for gold or for bank-notes was vainly encountered by statutes of which the earliest dated from the days of William the Third. From time to time indeed punishment was inflicted, but its incidence was rare and the law was almost with impunity defied. In 1804 we find three persons imprisoned for bribery at Ilchester, in Somerset. In 1819 Mr. Swan, M.P. for Penryn, in Cornwall, was fined and imprisoned, and Sir Manasseh Lopez was sentenced to pay £10,000, and to be imprisoned for two years, for bribery at Grampound, the notorious Cornish borough. In 1831, members for Dublin and Liverpool were unseated for corrupt practices, and in 1840, elections for Ludlow and Cambridge were made void on like grounds. In 1848, Sudbury, in Suffolk, was disfranchised, and St. Albans, in 1852, suffered the same fate. The investigation of charges connected with parliamentary elections was hitherto reserved for Committees of the House of Commons, and these gentlemen did not, nor could they, from the nature of the case, render justice in such matters. In 1854, the Corrupt Practices Act strove to deal with bribery and other evil modes of influencing electors, and in 1858 it was ruled that the payment of a voter's travelling expenses was "bribery". In 1859, gross corruption was proved to have been practised at Gloucester, Wakefield, and Berwick, and in 1866 government commissions of inquiry revealed disgraceful doings in elections at Great Yarmouth, Totnes, Lancaster, and Reigate, all of which boroughs were disfranchised by the Reform Act of 1867. By this time, the public conscience had become much enlightened on this subject, and an important step in advance towards electoral purity was taken in the Parliamentary Elections Act of 1868, which assigned the jurisdiction in election-cases to the judges of the superior courts. In 1870, the boroughs of Beverley, Bridgewater, Sligo, and Cashel were disfranchised for bribery and other forms of corruption.

The sincere and keen-sighted opponents of undue influence at parliamentary elections had long held that secrecy of voting was needed both for the protection of the electors against intimidation and for the suppression of the coarser forms of bribery. The method of voting by ballot, a term equally applied to the use

of a little ball or pebble, and to that of a ticket or a paper, dropped into an urn or a wooden box, was commonly employed for elective purposes in ancient Greece and Rome. A proposal for that method was carried through the Commons in 1710, but was rejected by the Lords. Towards the end of the eighteenth century, some of the Whigs were urging vote by ballot for parliamentary elections. Early in the nineteenth century, the followers of Jeremy Bentham, the great philosophical Radical, advocated the system with much earnestness, and we have seen that it became one of the six points of the Charter. The great historian, George Grote, proposed it in the Commons in 1833, and renewed the motion annually till 1839. In 1851, a motion for ballot-voting was carried in the Commons by a majority of 51. Mr. John Stuart Mill, the philosopher, a noted Liberal, argued against it on the ground that the franchise was a trust, and should therefore be openly exercised, but public opinion, greatly influenced by revelations of electoral corruption and coercion, came over to the ballot as the less of two evils, if it were an evil at all. In 1872, after one rejection in the Lords, the Ballot Act was finally carried, and introduced secret voting at all parliamentary and municipal elections, except parliamentary elections for universities. The same measure brought with it the great benefit of private instead of public nomination of candidates for parliamentary constituencies. The seeker of a parliamentary seat was no longer compelled, as he stood in the open air on a platform or "hustings", to face the uproar, and sometimes the brutal violence of words or acts indulged in by the riotous portion of an assembled mob of voters and non-voters. He would be no more liable to pelting with mud, stones, dead cats, or rotten eggs, with which missiles candidates in the past had been not seldom greeted as they sought to expound their views. Nomination-papers, signed by voters in the constituency, in favour of each candidate, were henceforth quietly handed to an official in a private room. The voters, as everybody knows, now make known their choice by placing a mark upon a paper containing the printed names of the several candidates, folding the paper, and dropping it into a large box, with perfect quiet in all the surroundings, and perfect safety and secrecy for themselves, if they but keep their own counsel. Whoever wishes to understand the nature of a contested parliamen[illegible] at the begin-

ning of Queen Victoria's reign need only turn to the earlier pages of *The Pickwick Papers*, where the Eatanswill election presents him with what is but a slight burlesque and caricature of the real historical facts.

The Ballot Act had dealt a severe blow to direct bribery by making it uncertain for the briber whether the expenditure of his money produced for him any useful result. Even then, however, the enemy was not slain. After the general election of 1880, a member of the new Liberal Cabinet was unseated for the corrupt practices, not of himself but of his agents, and widespread corruption was proved in the constituency of another minister. At last, in 1883, the Corrupt Practices Act began to work effectual reform. The legal expenditure of the candidate and his agents was limited to a certain sum, calculated on the number of electors, with heavy penalties for any expenditure, even of a character authorized by law, beyond this limit, and for any unauthorized expenditure of any description. "Bribery" was now made to include a promise to give refreshments, to pay travelling expenses, or to procure an office, and the holding forth to the voter of any valuable consideration whatsoever in return for his vote. If the candidate or any of his agents bribed, even to the smallest extent, or if bribery, not traced to any one, took place on any large scale, the election became void. Persons guilty of bribery could be punished by imprisonment, or by fine, or by incapacity to vote, or by incapacity for election to Parliament or for the holding of any public office. If a candidate were proved to have a guilty knowledge of bribery, he could be declared incapable for life of representing that constituency; if his agents were guilty, the candidate might be excluded, for seven years, from such representation. The terrors of this severe, ingenious, and searching statute have produced a real and entire change in the conditions of parliamentary elections. The pocket of the candidate is spared from undue expense, while the electioneering tout and the greedy voter have been deprived of their previous ill-gotten gains.

A direct benefit has ensued from the virtual abolition of bribery, and this in the way of political instruction. The candidate, no longer able to purchase his way into Parliament, is forced to appeal, in speech and print, to the intelligence and the sympathies of those who have the suffrages which can alone affix M.P. to his name. Making all allowance for misrepresentations in verbal addresses or

in printed matter distributed among the voters, every contested election contributes somewhat to the political education of the new democratic constituencies. The great assemblages gathered in public halls, the minor meetings in schoolrooms, and the knots of listeners on village greens, now have conflicting political principles and programmes presented to their mental view, and the electors can scarcely fail to arrive at some truth in the comparison of diverse statements and issues, and to winnow out some grains of wheat from the bushels of chaff with which they have to deal.

The cruel sport of cock-fighting, viewed by our kings in the cockpit at old Whitehall Palace, and made familiar to us, with the savage greed depicted on the faces of the spectators, by Hogarth's powerful touch, still flourished in the earlier years of this expiring century. George, the Prince Regent, and many of his noble friends, with town and country gentlemen, and persons in every lower grade, were eager viewers of and gamesters at this degrading form of amusement. The bull-baiting of the Tudor and Stuart times was not yet extinct. In October, 1809, on the occasion of the King's Jubilee, we read that "a fine sturdy animal, kept for the purpose, was baited at Windsor; in the opinion of the connoisseurs in bull-baiting, he furnished fine sport; but, at length, his skin was so cut by the rope that he bled profusely, and, as it was thought he could not recover, he was led off to be slaughtered". The fun consisted in fastening the animal to a stake with a rope some yards in length, and setting at him bulldogs, one at a time, trained to pin him by the nose. A yell of delight rewarded this feat of the puny, brave tormentor, but the spectators were not less charmed when the bull, receiving the dog on his horns, tossed him away to a distance, where he fell, dead or maimed, after his passage through the air. The views of some of our ancestors under George the Third are revealed by the reports of a debate in the Commons, in 1802, on a Bill to prevent bull-baiting. The Right Hon. William Windham, a distinguished scholar, orator, and statesman, who had been, and was again to be, Secretary for War, defended the amusement as one not more cruel than hunting, shooting, and fishing. He at last declared, in a burst of eloquence, his belief that "the bull felt a satisfaction in the contest". Another member avowed it to be "a glorious sight to see a dog attack a bull! It animates a British heart, &c." General Gas it to be an amusement which

the lower orders were entitled to, and expressed his "regret in observing a disposition in many members to deprive the poor of their recreations, and force them to pass their time in chaunting at conventicles". Mr. Wilberforce, on the other hand, denounced its barbarity, and referred to the evidence of magistrates for an instance of a mild-tempered bull, that did not sufficiently resent the attacks of the dogs, being roused to fury, after the use of many other expedients, by sawing off his horns, and pouring a stinging liquid on to the stumps. Sheridan supported Wilberforce, but the Bill was thrown out.

As time went on, public opinion was aroused, and that opinion took shape in effective legislation. England was the first country in the world that formed any society, or passed any laws, for the prevention of cruelty to animals. The English society for this purpose, and under this title, was founded in 1824; and the Scottish society in 1839. An Act of 1835 put an end to bear-baiting and bull-baiting, and a statute passed in 1849 imposed a penalty of £5 on any person connecting himself with cock-fighting. With regard to other animals, the writer well remembers, when he lived as a boy in Leicestershire in 1846 and some following years, seeing dogs in pairs engaged in drawing small carts filled with goods. An Act of 1839 prohibited this use of dogs in London, and this was afterwards extended to the country. Statutes passed in 1854, 1861, and 1876 make cruelty to domestic animals liable to fine and imprisonment, while the killing, maiming, and wounding of cattle are punishable by long terms of penal servitude. The tamed beasts in menageries are thus protected, and the torturing or ill-treating of any animal is liable to a fine of £5. Working horses, and animals and birds conveyed by rail, are protected by laws put in operation by the Society's vigilant officers, and kindness to animals extended, in 1861, to the foundation in London of a home for stray dogs, an example which has been imitated in other places.

Prize-fighting with fists between men, or pugilism, was in its palmy days from the middle of the eighteenth century until about 1860. The Prince Regent was a warm patron of the sport, which was conducted under strict rules of the P.R., or Prize Ring, and its supporters included men so high in fame and character as the Duke of Wellington, Sir Robert Peel, and Lord Palmerston. The last notable encounters were the one between the Englishman, Tom

Sayers, and the gigantic Irish-American, Heenan, in April, 1860; and that conducted nearly four years later, between Heenan and Tom King, who afterwards became a most honourable and respectable "bookmaker", or professional better on the turf. The Sayers *versus* Heenan contest remained, after a desperate struggle, a drawn battle. In the latter fight, King decisively conquered Heenan. In this country, the sport survives only in the form of fighting with gloves of various degrees of thickness in the padding. The brutal form of conflict with naked fists died out partly under the influence of public opinion; partly from increased vigilance among the county police, rendering it very difficult to conduct the affair to an end without interruption; and partly from the lack of wealthy patrons who formerly provided substantial sums in the form of stakes as a prize for the winner of the fight.

All middle-aged persons can recall the public nuisance and indignity caused by the barriers which crossed the roads as "turnpike-gates" or "toll-bars". A strong feeling of aversion arose within the breast of the traveller by horse or carriage, of the trader with his cart or waggon, and of the drover with his horned cattle or sheep, who found their passage hampered and their time wasted by these obstacles to free social and commercial intercourse. The toll-gate keeper, gathering his dues in sums varying from twopence to eighteenpence per vehicle, according to its use, to the number of its wheels and horses, and the special regulations of the "trust" which controlled the highways of the district, was regarded by travellers with an angry eye. The great humourist, in *Pickwick*, makes the elder Weller, in a moment of discontent, resolve to quit the cheerful world of stage-coachmen, and "keep a 'pike", to avenge his wrongs on the travelling class of his countrymen. The toll-gates of England were the wonder of foreigners who had come to our shores as visitors in the much-belauded "land of the free". The first turnpike-gates arose in 1663, on the old highroad from London to York, and at once excited the wrath of the waggoners, drovers, and pack-horse carriers, some of whom at first broke down the bars. The new device for raising funds to repair the roads held its ground, and spread until the whole road-surface of the British Isles was marked at intervals by the obnoxious 'pikes. One of the strangest episodes in our later history had its origin in this method of maintaining the highways. The inhabitants of the rural districts

of Wales had urgent reason to complain of tolls so heavy as sometimes to absorb the profit on produce carried to market by the humbler class of farmers. In 1839, a very unpopular set of gates was pulled down on the borders of Caermarthenshire and Pembrokeshire, in the belief that they had been illegally erected. The magistrates upheld the people's view, and the roads were henceforth left free of those particular barriers. This victory dwelt in the minds of the rude and primitive inhabitants, and, some years later, a regular conspiracy against toll-gates and toll-houses was formed. The supporters of this plot took the name of Rebekahites, or Rebekah's daughters, from the text in Genesis xxiv. 60, where Rebekah's kinsfolk bless her in the words, "Let thy seed possess the gate of those which hate them". In the winter of 1842 and the spring of 1843, bodies of men, some of whom were clad in women's clothes, all having veiled faces, went about in the counties of Caermarthen, Cardigan, and Pembroke, under the leadership of a "Rebekah" in feminine attire. The attacks on toll-gates were marked by the utmost cunning, vigour, and success. While the magistrates and constables were gathered at one point, where an attack on a particular gate was feared, from hints or information purposely given to mislead, half a dozen gates and houses would be levelled to the ground in other parts of the district. At dead of night, the toll-keeper and his family were aroused from slumber by the blare of cow-horns, and the popping of guns. The door was burst open, and a crowd was beheld, furnished with flaring torches and glittering saws and hatchets. The furniture of the abode was carried out and laid in the adjacent field. The gate-posts were sawn off close to the ground, and the gate was chopped up. The toll-house was swiftly unroofed, the walls levelled, the floor-flags pulled up. When the road was made clear, and the collector's house had ceased to exist, the Rebekahites mounted and rode away to some distant point of planned destruction. The soldiers then arrived to find the keeper and his family alone beneath the stars, and pursuit was often baffled by misdirection from the peasantry, who were all in sympathy and league with the rioters. Chartist emissaries, as the year 1843 advanced, induced the foes of toll-gates to begin a warfare against tithes, and rents, and the establishments and system of the new Poor Law. Matters in South Wales then assumed a serious aspect. Threatening letters were rife; magistrates' houses were attacked

with shots through the windows. A mob of some thousands marched into Caermarthen, and half-destroyed the workhouse before soldiers arrived and ended the affair with the wounding of some rioters, and the capture of several hundreds of their number. In some instances the "Rebekah" assailants of toll-gates were captured. The movement then assumed a ferocious form, and active magistrates suffered from the burning of their stacks. Lawlessness at last reached the point of cruel murder, and in the autumn of 1843, an old woman, seventy years of age, was shot dead by Rebekahites who had fired the thatch of her toll-house. She met her fate through calling out that she knew the assailants. The coroner's jury, coerced by fear, returned the monstrous verdict that "the deceased died from the effusion of blood into the chest, which occasioned suffocation. But from what cause is to this jury unknown." Order was restored at last by the drafting into South Wales of a large military force, with a body of the active and intelligent London police, who hunted down the secret agents of the mischief. A special commission tried the prisoners, and another commission, for inquiry into grievances, reported that the hardships under the existing turnpike system of South Wales were "real and intolerable". An Act of 1844 carried out the objects of the Rebekah movement by consolidating and amending the laws relating to turnpike trusts in that quarter. So lately as 1871 there were, in most parts of Great Britain, toll-gates at a distance of every six or eight miles, and about 5000 persons were employed as toll-collectors, exclusive of their families. The people of Ireland were the first to be relieved of this burden on travellers, by an Act of 1857, which abolished the last one existing in the country. The removal of the bars in England began near London. Twenty-seven were swept away before 1860. In 1864, about eighty on the north side of London disappeared, and about sixty, on the south side, vanished in the following year. In 1883, Scotland saw many of her toll-gates removed, and in 1889 Great Britain was finally rid of this encumbrance on her roads. The bridge tolls of London were all removed before 1880, and in 1893 almost complete freedom of traffic was secured in the removal of certain gates, not liable to toll, in the north-west of the metropolis. The only surviving barriers are those on some country bridges, and the necessary payments for the support of sea-side piers. An Act of 1835, and subsequent amending

statutes, provide for the maintenance of roads by the ratepayers of parishes and districts, under the control of highway boards, composed of "waywardens" and justices; or, under the Public Health Act, of urban sanitary authorities; or, under the Local Government Act of 1888, of the county councils. The old turnpike trusts have thus been superseded, and an Act of 1878 created a new class of main roads under the joint management of parish or district authorities and those of the county. In Scotland, the Roads and Bridges Act of 1878 vests the management of all country roads in county road trustees; in the towns they are controlled by the burgh council or by the commissioners of police.

At the beginning of the nineteenth century, a gentleman was almost forced, if he wished to retain his social position, to accept a challenge to fight with sword or pistols, or to issue such a challenge in case of being subjected to certain degrees of insult in word or deed. At the present day, and for many years past, the practice of duelling is and has been matter for mere ridicule. The issuer of a challenge to personal combat with deadly weapons would be either treated with utter contempt, or brought before a magistrate and bound over in sureties to keep the peace. If a duel were fought, and a fatal issue came to one or more of the combatants, the surviving principal, if any, and the "seconds" on both sides, would be tried for murder, and, on conviction, would incur the gravest risk of death by hanging. Statesmen of the highest rank, under George the Third, and, in one instance, under his son, were found confronting an adversary pistol in hand. Early on a May (and Sunday) morning in 1798, Mr. Pitt met Tierney, a fellow-member of the Commons, in a bloodless contest, of two shots from each foeman, on Putney Heath. His great rival, Charles James Fox, was wounded in a duel with a War-Office official, indignant at the great Whig's denunciation of the gunpowder issued by that department of the government. We have seen George Canning and Lord Castlereagh in action after the failure of the Walcheren expedition. In 1829, the Duke of Wellington fought his first and only duel, in Battersea Fields, near London. His adversary was the Earl of Winchilsea, who had charged the victor of Waterloo, then Prime Minister, with the "insidious design of introducing Popery", because he was supporting Catholic Emancipation. The weapons were pistols, and an apology was tendered and accepted

after the Duke, in presence of a crowd of spectators, had purposely fired wide, and Lord Winchilsea had discharged his weapon in the air. The duel was an institution, in the earlier decades of the century, of conspicuous service in drama and novel, and of common occurrence in connection with political controversy, contested elections, quarrels over cards, and squabbles due to the presence of wine and absence of wisdom. There were lamentable instances of promising careers cut short, of happy wives made widows, and of children deprived of a loving father, by this most barbarous and senseless practice, which did not even guarantee the "wild justice of revenge" in providing for the punishment of a wanton and cowardly aggressor, confident in his skill with pistol or sword, and relying for safety on his victim's lack of practice with his weapon. O'Connell, the Irish leader, had his life for many years embittered with the remorse which he felt for having slain, in a pistol-duel at Dublin, in 1815, his Protestant adversary, Mr. D'Esterre. The survivor of this contest settled a pension on the widow, and never passed the dead man's house in the Irish capital without uncovering his head and breathing a prayer. He also made, and kept, save in accepting a challenge from Sir Robert Peel, a solemn vow never to "go out" again. In this instance, the meeting was prevented through his arrest on his wife's information to the police, and his being bound over to keep the peace. We have already dealt with Lord Cardigan's duel with Captain Tuckett in 1840, and the flagrant miscarriage of justice in connection therewith. A disgraceful instance of fatal duelling occurred early in the reign of William the Fourth, and excited a disgust which did much to check the resort to these encounters. Sir John Jeffcott, just knighted, and on the eve of departure to Sierra Leone as chief-justice, had a quarrel with Dr. Hennis of Exeter concerning some remarks attributed to the latter. The doctor denied the utterance of the words imputed, but was denounced as "a calumniating scoundrel", and forced out to fight, in spite of strenuous efforts on the part of friends. The encounter took place with pistols on Exeter race-course, and Dr. Hennis was shot dead on the ground. Jeffcott then set sail for West Africa, and was tried in his absence and acquitted, according to custom in duelling-cases. He was obliged, however, to resign his judicial post, and was drowned, a few months later, by the upsetting of a boat off

the African coast. In 1843, another fatal duel, of a grievous character, greatly influenced public opinion. Colonel Fawcett, in that year, was killed by his brother-in-law, Lieutenant Munro. An Anti-duelling Association was soon afterwards formed, consisting of more than 300 members, including many officers of both services, with peers, baronets, and members of the Commons. Duelling was by them denounced as contrary to the laws of God and man, and as being eminently irrational as well as sinful. The members further pledged themselves to discourage, by influence and example, the practice which they thus condemned. In the following year, the matter was taken up by a personage very near the throne. The excellent Prince Albert, with the full sanction of the Queen, induced the War Office to issue some amended articles relative to duelling. All officers concerned in such encounters were plainly threatened with court-martial and cashiering, and it was pointed out that honourable men are always ready to apologize for offence given in mistake or haste. A reference to friends, or, in the last resort, to the commanding officer on the spot, was to suffice for all purposes of personal justification. From this time the practice of duelling was doomed to extinction. Macaulay has pointed out, in one of his most powerful essays, that "in all countries those men whose calling is to put their lives in jeopardy for the defence of the public weal . . . are considered as the best arbitrators on points of honour and manly bearing". When the officers of the British army were bound by the rules of the service and by the Articles of War, neither to give nor to accept challenges to personal combat in private quarrels, no civilian could feel forced to indulge in such playing at murder. The last fatal duel fought in England took place in May, 1845, between Lieutenants Hawkey and Seton, when the latter was killed. His slayer, who had been greatly provoked, escaped with a term of imprisonment, but an intimation was given from the bench of justice and from the Home Office, that henceforth no killer of his antagonist in a duel would escape the capital penalty.

Some readers of this work will be, it is presumed, surprised to learn that the victories of Nelson and his famous compeers in maritime warfare were gained by crews of British seamen largely composed of men who were forced to serve in His Majesty's navy. The treatment of sailors on board the ships of the royal navy was

A VICTIM OF THE PRESS-GANG MAKES A STOUT RESISTANCE.

The system of impressment, or forced service on board of a man-of-war, was a frequent cause of injustice and disorder in what is known as "the good old times". His Majesty's ships were frequently short-manned, especially during the long French wars at the beginning of this century, and to increase the supply of His Majesty's seamen was the business of the Press-gang. A barbarous device it proved itself to be in the hands of the ruffians who were employed in the service. The British ports were scoured ruthlessly; and many an unsuspecting jack-tar was haled off by the Press-gang to years of foreign service without a word of farewell to his friends or family. Even the innocent young countryman on a visit to a seaport with his sweetheart was frequently seized, but not usually until he had, with proper British spirit, broken a few of the rascals' heads. Altogether the armed Press-gang was an inhuman system which, happily, has fallen into disuse, although the law which gave it sanction still remains in force.



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very bad in some respects. The food was unwholesome, the flogging was, with some captains, frequent and severe, and mutinies were, as we have seen, the natural consequence of harshness and injustice towards brave men. The system of impressment, or forced service on board a man-of-war, was a chief cause of the quarrel between Great Britain and the United States in 1812. Fighting-ships short of hands sought to complete their numbers by seizure of seamen either afloat or ashore, and many a tar in British ports, pounced on by the pressgang, and hurried on board ship, was carried off for years of foreign service, without a chance of farewell to his family or friends, leaving, in many cases, a wife and children devoid of help from, or even knowledge concerning their natural protector. The system was, in fact, one of the senseless barbarities of the "good old times" when authority, under rule little curbed by Parliament or Press, failed to offer the inducements to voluntary service which would have manned all the ships with blue-jackets eager to fight the French, to win prize-money, and to "see the world". Serious fights, often attended with loss of life, arose from the resistance of sailors seized by the armed pressgangs. The action of these parties of men was protected by statutes dating from Tudor times to those of George the Third, with certain exemptions for marine apprentices, fishermen at sea, part of the crews of colliers, and harpooners of whaling vessels. From time to time the regulations were mitigated, but the laws permitting impressment, long obsolete, have never been formally repealed. The British navy has long been manned by volunteers, sometimes attracted by a system of bounties.

During the first four decades of the century, an exciting, lawless, and, ofttimes, dangerous phase of seaboard life in the British Isles was due to the prevalence of endeavours to evade the custom-duties on imports from abroad by the secret introduction of goods in "smuggling". The temptation to smugglers lay in the heavy duties charged on foreign spirits, tobacco, and the finer kinds of manufactured goods, such as velvets, silks, lace, and kid-gloves. The vessels engaged in the traffic were swift-sailing cutters, luggers, and other small craft, whose first business was to escape capture and search by the revenue cruisers that swept the narrow seas, and then to get their ladings ashore, if possible, without the knowledge of the coast-guardsmen. These officers of

the law, night-glass in hand, were peering from the cliff-tops in search of suspicious sail, or of boats stealing in, with muffled oars, from a vessel in the offing, towards a sandy beach, convenient for a landing, near a lane leading inland, with carts in readiness to carry off the goods. Sometimes the smuggled cargo would be brought to a rocky shore, furnished with caves affording concealment for bales of merchandise and for casks of liquor. In many instances, the smuggling band came into collision with armed parties of the coast-guards, drawn to the pre-arranged place of landing either by their own shrewd divination of a likely spot, or by information due to the treachery of some confederate in the contraband trade, or to spies in the pay of the customs authorities. The smugglers, bidden to "stand and deliver their goods in the King's name", often showed fight, and encounters marked by loss of life and many a wound furnished matter for exciting stories in the later Georgian times. The ingenuity of smugglers, combined with cool audacity, sometimes enabled them to bring in goods beneath the very eyes of the revenue officers. A boat's load of geese, dressed for the table, brought from a vessel just arrived from the Channel Isles, a great depôt for continental goods destined for smuggling, would be stuffed with French lace to an enormous value. Long bundles of lathes, liable to no duty, would each enclose a cylindrical tin-case, filled with many pounds of tobacco tightly rammed. The ends of the bundles showed nothing but wood, consisting really of short pieces hiding the valuable stuff within. A very large capital was invested in this contraband trade. In suburban Streatham, on the outermost Surrey-skirts of London, where these lines are being written, one of the finest modern houses once bore the name of "Smuggler's Hall". Its owner was head of a firm of warehousemen in the City of London, who dealt largely in the finest French manufactures. Much that was sold by this and other firms, at vast profit to themselves, never paid a farthing of duty to the Crown. A confederacy in the metropolis provided funds for the purchase of suitable vessels, and ample pay for the bold and skilful men who brought over the goods from France. A most artful device was adopted to secure a place of concealment on the Dorsetshire coast. A mansion, with surrounding wooded land, about two miles from a suitable shore for landing the cargoes, was rented by one of the London

confederacy. This man procured his appointment as a county magistrate, and, under this mask, superintended the reception of goods. The courtyard of his house contained a well-like excavation, the bottom of which was expanded into a roomy cave that would contain many bales of merchandise. The occupant caused information against himself to be given to the commander of the coast-guard in his district, who was advised to search the premises for smuggled commodities. A party of his men made a forcible entry and carefully examined every room and cellar. The courtyard-well became an object of suspicion, when nothing contraband could be found elsewhere, and a bucket was let down to test its character. It came up filled with water, because the lower space that gave entrance to the cave contained a cask that fitted the aperture, and, filled with water, provided the appearance of an actual well. The occupant of the house then demanded to know why his domicile had been violated, and began an action against the Crown for damages. From that day forward, until one of the smugglers betrayed the secret, the house was a safe depôt for the goods that were landed, and the confederacy, after making fortunes by their frauds, compounded with the Crown for penalties incurred in their detected smuggling by the payment of sums which they could well afford. As for the risks incurred by smugglers, the present writer has often talked, on the Dorsetshire coast, with an innkeeper who, in his younger days, helped in "running" many a cargo of spirits. Chased by the coast-guard, as he climbed the cliff, with two brandy-kegs slung around him, he was fired at, when he would not stop his flight, and one of the kegs received the bullet meant for his body. Such was the extent of this illicit traffic, that in 1831, by the official estimate, the annual loss of the revenue by smuggling, exclusive of tobacco, approached a million sterling, of which half a million was due to French brandy. In Ireland, three-fourths of the tobacco that was consumed paid no duty, and three-quarters of a million was expended in the British Isles on the preventive coast-guard service. In 1840, it was estimated by the revenue department that nearly half the French silks that were sold in this country were introduced by the contraband trade. The reduction or abolition of duties, which will be dealt with elsewhere, put an end to the smuggling of nearly all commodities except spirits and tobacco, in which a small contra-

band trade is still fitfully carried on. The seizures of tobacco and cigars, in 1889, amounted only to 18,000 lbs., and of foreign spirits, to less than 200 gallons. There is no reason to suppose that any large quantity escaped the vigilance of the customs officers, so that this species of fraud on the revenue is all but extinct.

The wide prevalence, in this age, of betting on horse-races debars us from pointing to anything like an extinction of gambling. One mischievous form of this detestable vice was greatly checked by legislation in 1826. The story called *The Lottery*, in Miss Edgeworth's *Popular Tales*, is an excellent demonstration of the ruinous effects, on the wage-earners and the small traders, of the system by which prizes were assigned to certain numbered tickets issuing, by pure chance, from an apparatus called a lottery-wheel. Sums of money up to £20,000 might be won by lucky purchasers, the tickets being also divisible into shares of halves, quarters, eighths, or sixteenths, so as to attract a larger number of investors. The numbers to which no prize was attached were said to "come up blank", and, during the time of drawing tickets from the wheel, a feverish excitement filled the minds of those who had, in many cases, invested all their savings in the purchase of one or more chances of becoming suddenly rich. In the eighteenth century, there were many state lotteries, raising sums of money for public use, but these were abolished by statute in 1826, and Acts against private speculations of the same character were then vigorously applied, with the effect of suppressing what had become a public nuisance.

A petty trouble or annoyance, of daily and inevitable repetition, is a serious interference with the comfort of life. Only those who were born some years prior to the accession of William the Fourth can ever have been acquainted with the misery due to the tinder-box. Whoever desired, amid the darkness of night, or the gloom of a wintry morn, to procure a light in a bed-chamber, or the means of kindling a fire, might spend some minutes of valuable time, and incur much loss of good-temper, in vain struggles to strike an effective spark from the only resource existing before the invention of lucifers. The apparatus employed was, in general, a flat round box of iron or brass, containing tinder composed of charred linen or cotton rags. The lid being removed, the searcher after light struck together, over the box, a piece of flint or agate and a piece

of hard steel, until a spark fell upon the tinder. When this event occurred, the faint germ of fire had to be tenderly blown until it became fit to kindle a thin splint of wood, called a brimstone-match, some inches long, with each end pointed and tipped with sulphur. The flaming match would then be of use for lighting a candle or lamp. A superior mechanism consisted of a pistol-lock, with a reservoir of tinder in place of the priming-pan. A small candle-stick with a wax taper was often combined with the tinder-box or pistol. The painstaking procedure just described began to cease from tormenting many Britons about the year 1827, though it was long before the matches producing light by friction came into general use from cheapness combined with efficiency. The first lucifer matches were tipped with a mixture of chlorate of potash and sulphide of antimony, after being first dipped into melted sulphur. Ignition was caused by smartly drawing the match through a piece of folded sand-paper. Three years later, in 1830, the matches called Congreves came into use, with phosphorus in place of the sulphide of antimony. They were then sold in tin boxes of fifty at half a crown per box, each box containing a piece of glass-paper, or paper sprinkled with powdered glass, on which to strike the matches. As years went on, the matches, improved in readiness of ignition, came down to a penny per box, and, in still later times, the offensive smell of sulphur gave way to paraffin. The safety matches, invented in Sweden in 1855, divide the means of ignition between the match and the friction-paper on the box, so as to avoid the danger, to which many fires were due, of accidental ignition by friction on any hard surface, such as sometimes happened with the teeth of mice or rats. Wax vestas, paper fusees, and vesuvians dear to smokers needing a light in a high wind, are well-known later developments of the original friction matches.

Only the elder among those who were born under Queen Victoria can remember the affliction of candles that needed the use of snuffers. The sight of the implement, almost the very name, is unknown to the present generation of our people. A pair of scissors, with a box, open on its left side, fixed on the right-hand blade, for the reception of the portion of wick cut off by the left-hand blade, describes the obsolete apparatus. The lonely sempstress at her garret toil; the reader in his study; the social party in the parlour—all the users of artificial light who could not afford, or did

not choose to employ, gas or oil-lamps or candles made of wax, with self-consuming wicks, were subject to the trouble of frequent snuffing, and the offensive smell of smouldering cotton. The remedy came, apart from the introduction of other forms of light, in the manufacture of candles from better materials than mere melted tallow, and with a finer wick than the loosely-twisted cotton yarn of earlier days. The discovery of stearic acid in tallow, and of palmitic acid in palm-oil, through the researches, early in the century, of the great French chemist, Chevreul, led the way to improvement in the making of candles. About 1850, the introduction of paraffin, a white transparent crystalline substance first obtained from wood-tar, and then from coal and shale, as a commercial product, by James Young, F.R.S., made an enormous change in candle manufacture, and paraffin candles are those now most largely used in the United Kingdom. The plaited wick, which bends over during the process of combustion, and completely burns away as the heated end receives a supply of oxygen, effected the banishment of snuffers from household use.

CHAPTER II.

GOOD THINGS INTRODUCED OR MAINTAINED.

Methods of illumination—Use of oils—Gas-lighting—William Murdoch—Electric lighting—Dangers of miners—Safety-lamps—Precautions against fire—Fire Brigades—Life-boats, &c.—Labour-saving devices—Sewing-machines—The type-writer—Type-setting machines—Improved means of cooking—Alexis Soyer—Introduction of restaurants—Reform of the police system—Protection of property—Safe-deposits—Trade-marks—Trade-protection societies—Use and sale of poisons—Diffusion of scientific knowledge—The British Association—Royal Societies of London and Edinburgh—Royal Geographical Societies—Botanic Gardens at Kew—The "Nautical Almanac"—Storm-warnings and weather forecasts—Publication of state records—Ordnance and Geological Surveys—Registration of births, deaths, and marriages—Dr. William Farr—The decennial census.

Apart from new means of locomotion, we here note devices and changes of great importance to public and domestic comfort, convenience, and safety, and to the diminution of human labour. Dealing first with methods of illumination, or the provision of artificial light at home and abroad, in the chambers of houses, in streets and roads, and in public buildings of every class, we find a vast improvement

in oil-lamps, both in the construction of the burning-apparatus, and in the material consumed therein. The coarse, smoky lamps of early use burnt animal-fats and oils expressed from the bodies of fish. These were superseded by the more limpid vegetable oils extracted from the seeds of colza or rape, and of other plants, and from various kinds of nuts. Towards the end of the eighteenth century, the old round, thick, and smoky wick was exchanged for the flat ribbon-shaped article, and the two Argands, Genevan chemists, brought in the ringed wick, and the glass cylinder, as a chimney over the flame, which produced steady burning, with a constant draught of air, and made their name live in "Argand burners", as used in the present day for gas. About 1840, the "Moderator" lamps, due to a Frenchman named Franchot, gave a simple and effective mechanism for regulating the flow of oil to the burner from the cylindrical reservoir below. The introduction of mineral oils, under the various names of paraffin, kerosene, and benzoline, burnt in lamps with either flat or circular wicks, was a great advance in the way of pure and brilliant lighting for every place and purpose. "Duplex" and "Triplex" lamps, respectively furnished with two parallel wicks, and with three flat wicks arranged in a triangle, appeared as British inventions in 1865 and in 1874, and supplied still more powerful and popular modes of lighting with mineral oils. Refined extracts of the petroleum supplied since 1861, in quantities so vast, from the oil-wells of Pennsylvania, and since 1880, from Baku, on the Caspian Sea, are also largely used in stoves for heating and cooking.

A revolution in lighting came with the adoption of gas extracted from coal. Towards the end of the eighteenth century, on a very small scale, coal-gas was used for internal lights. William Murdoch, in 1792, thus dispensed with candles or lamps in his house and office at Redruth, in Cornwall. This ingenious man, a native of Ayrshire, had entered the service of Boulton and Watt, the great Birmingham engineers, and was by them dispatched to superintend the erection and fitting of their steam-engines in Cornish mines. In 1798 he erected a gas-apparatus on a large scale at their Soho Foundry, Birmingham, and the new illuminant came fully into public notice in 1802, when the exterior of the factory blazed with light in celebration of the Peace of Amiens. In 1805, Murdoch lit up some mills at Salford, near Manchester, with gas issuing from one

thousand burners. In 1803, a Mr. Winsor showed the new mode of lighting in London, and in 1810 a National Light and Heat Company, under an Act of Parliament, was formed at his suggestion. Pall Mall, in London, was soon lighted with gas, but the new device had to win its way against fierce opposition, inside and outside Parliament, from those who denounced it as likely to ruin thousands of people connected with the whale-fisheries that supplied oil for lamps. In 1813, Mr. Samuel Clegg or Gleg, Murdoch's successor with Boulton and Watt, made great improvements in purifying, distributing, and measuring the new material, and the illumination of Westminster Bridge by gas, in the same year, was the forerunner of rapid progress throughout Great Britain in the new style of lighting public thoroughfares. In 1823, more than 200 miles of streets in London were supplied with gas-pipes, and about 40,000 public gas-lamps were lighted by the three chief companies. The time had arrived when, in the historian's emphatic words, men were to "see the capital all the year round, from dusk to dawn, blazing with a splendour beside which the illuminations for La Hogue and Blenheim would have looked pale". The new method of lighting our towns had also a very important influence on the protection of street-passengers from ruffians and rogues, and there is much truth in the remark that "the adventurers in gas-light", meaning Winsor and his associates, "did more for the prevention of crime than the government had done since the days of Alfred". There is no need to descant on the social benefits derived from the method of lighting which is now universal—in the rooms of the humblest dwellers in towns, in many of the larger villages, in public halls, in stately churches, in railway-carriages on every line of traffic, from the slow-paced trains of the Underground Railway in London to the expresses hurrying northwards to the great Scottish towns, and westwards to Penzance. Incessant improvements, in the methods of purifying the gas at the place where it is made, in the form of burners, and in the shape and material of the chimneys and other glasses placed around the flame, have greatly added to the purity and power of the light due to coal. The softest radiance comes from the use of Argand burners; the most brilliant and wholesome light for large halls issues from the "sunlight" composed of rings of union jets placed horizontally on the base of a cone leading, through the ceiling, to a ventilating flue.

In these later decades of the century, the brilliancy of gas has been surpassed, and the noxious heat and other evil qualities of gas have been evaded, in the use of electric lighting. This illuminant is obtained through heating a suitable material to incandescence by passing through it an electric current. The substance usually employed is carbon, from its power of enduring a very high temperature without melting, and from its high emissive faculty. It was in 1810 that Sir Humphry Davy discovered that, when two carbon-rods, connected with the terminals of a powerful battery, are brought into contact and then slightly separated, the electric current continues to pass across the gap, in the brilliantly luminous "electric arc". The points of the rods become highly incandescent, and the space between them is occupied by a kind of flame, composed of a number of particles of white-hot carbon. For many years, this fact remained nothing but the basis of a pretty experiment. The intensity of light thus produced had no commercial importance or value until the dynamo-electric machine, partly due to a discovery of Faraday's in 1831, furnished the means of producing electric currents, at moderate expense, on a large scale. It was the electrician Gramme, of Paris, who, in 1870, showed the means of creating a current continuous in direction and uniform in strength. A successful arc-lamp, of French construction, was patented in 1857. In 1876, the Jablochkoff candle, in which the arc was formed between the ends of a pair of parallel carbon-rods slowly burning down in the heat of the current, gave another form of the electric light, and before 1880 various forms of simple and effective arc-lights were illuminating large rooms, streets, and other out-door spaces. Electric lighting for domestic purposes became first successful in 1879, when the separate inventors Edison and Swan produced incandescent lamps. Here the incandescent conductor was composed of a fine thread or filament of carbon, inclosed in a glass globe almost destitute of air, so as to prevent the wasting of the carbon through combustion. The steadiness, and lower temperature, and whiteness of light, in the new form, were great advantages, and, unlike gas and the arc-light, the incandescent light gives off no products of combustion to vitiate the air of the place which it irradiates. The new illuminant is extensively used, for lighting harbours and open spaces, in the form of naked arc-lights, which

give more light in proportion to expense. In hotels, shops, dwelling-houses, and steamboats, the incandescent lamps are nearly always found. Street-lamps and houses are supplied with currents, through copper conductors, from central stations where the electricity is generated by dynamo-machines, driven by steam-power.

In some former pages of this work, we have seen the disastrous effects of explosions in coal-mines, due to the ignition of inflammable gas in the workings. The carburetted hydrogen disengaged from coal-seams becomes dangerous in mixture with about ten times its volume of atmospheric air, and the explosion of what miners call "fire-damp" produces equally fatal effects in rendering ten times its amount of atmospheric air unfit for breathing in the form of choke-damp. Early in the century, the great chemist, Sir Humphry Davy, made experiments which ended in his invention of the famous Safety Lamp, the greatest boon ever conferred by science upon the workers in coal-mines. The flame which burns inside the lamp is prevented from igniting inflammable gas outside by enclosure within a gauze of iron-wire, with apertures somewhat less than one-twentieth of an inch square. When fire-damp is encountered, the lamp-flame often becomes enlarged in a pale form so as to fill the gauze cylinder, and the danger arises of the metal being oxidized and easily broken. The miners using the lamp are warned by the change of flame in time to escape to a safe part of the mine. Davy's lamp dates from 1816, and soon came into general use. About the same time, Dr. Clanny, of Sunderland, introduced another lamp for the same purpose, having a thick glass cylinder round the light, and a narrower cylinder of gauze at the top for the entrance of air to feed the flame. George Stephenson's lamp, the "Geordie", had a glass cylinder, with a cap of perforated copper, inside the gauze. In highly explosive air, the light of Stephenson's lamp goes out. In the ill-ventilated days of mines, the air-current did not exceed a speed of five feet per second, but with improved ventilation that rate was often quadrupled, and the former "safety-lamps" ceased to be safe when the heated gas inside could be blown through the apertures of the gauze. The original Davy-lamp has long been superseded by improved forms which provide against this risk by the use of glass cylinders and of two or three gauzes, and which also furnish a far better light.

When George the Third was king, the appliances both for extinguishing conflagrations and for rescuing human life from the risk of death by burning or by suffocation were very imperfect. The brazen hand-squirts and leathern buckets of Stuart days were, to some degree, superseded in the eighteenth century by Newsham's fire-engine, flinging water to the height of about 150 feet, but the nineteenth century was well on its course before any great progress was made. In 1829, steam was first used to drive the pumps of a fire-engine in this country, but only after 1860 did people see in common use the really powerful and effective steam-machines of the present day, with floating engines, driven by steam, battling on the Thames against water-side fires. Some benefit has, of late years, been derived in early stages of a fire from the use of chemical fluids evolving carbonic acid gas, the foe of all combustion, and from hose on the premises, attached to a hydrant connected with a constant water-service at high pressure.

Machines without skilled men to work them were of little avail, and the parish-beadle, with the parish-engine, and a crowd of boys and stray men in attendance, long remained the chief resource of householders who found property and life imperilled by fire. The insurance companies had, indeed, their own engines and firemen, bearing the emblems of each separate office, but there was no unity of action until 1825. In that year, some of them united their forces against fire, and in 1830 a movement was started in London for the combination of all the chief separate metropolitan establishments. Three years later, ten of the leading offices formed the London Fire Brigade, headed by Mr. Braidwood, the distinguished man whose death we have recorded in describing the great London-Bridge or Tooley-Street fire of 1861. In 1865, the Metropolitan Board of Works, under an Act, assumed the charge of this body, with all its appliances, and the whole service for London was greatly extended and improved. The firemen, known by their strong helmets and metal epaulets, have long been renowned for their self-devotion and skill in saving property and life. They are aided by some volunteer fire brigades, and by salvage-corps maintained by insurance companies. In 1889, the existing force of nearly 700 men, 150 fire-engines, inclusive of 55 worked by steam, with 155 fire-escapes and other appliances, came under the control of the London County Council,

who at once resolved to increase the resources against fire by adding 138 firemen, 4 stations, with steam and manual engines, and 50 fire-escapes. Most of the larger provincial towns have fire brigades of the same organization as that of London. Speedy notice to the fire-stations is provided in London and many other places by the electric alarms placed in the streets. A small box, with a glass side, to be broken in case of need, contains a button to be pressed or a handle to be pulled. The signal is thus given to the nearest firemen, who, within a few minutes, turn out with steam up in the engine, horses ready to start, axes, ladders, and every needful device.

The prevention of fires, a far better thing, in this as in other mischiefs, than cure by extinction, has been aimed at in so-called "fire-proof" buildings. In the true sense, no such edifice exists. Stone splits under the action of heat, and iron-girders, expanded by the same agency, thrust down the walls which they connect, or, in a heated condition, break up under the sudden cooling by the injection of water upon their surface. A near approach, however, to perfection in this line is attained by a judicious combination of thick walls of well-baked bricks, wood armed against fire by steeping in chemical solutions, concrete for floors, metal beams or girders encased in fire-clay blocks, and double iron-doors, with a fair space between them. Much ingenuity has been expended on the means of escape from fire which has fairly seized an edifice containing human beings. Among these appliances are ladders in a series that can be jointed together, and various combinations of ropes, ladders, baskets, and nets. The usual fire-escape is composed of a long ladder mounted on a four-wheeled carriage. The sides of the ladder are fortified with wire-rope, and it is furnished with a trough of copper-wire netting, down which people may slide from a window to the ground with ease and safety. Other ladders, jointed on to the main portable staircase, can be added for the reaching of greater heights than usual. At theatres, so liable to sudden and fatal outbreaks, the precautions include the letting-down of a strong iron-screen, which cuts off the stage, the general source of the fire, from the auditorium, and the provision of wide passages leading straight to the exit doors, and of extra doors easily opening outwards.

There are few objects which appeal more strongly to the

interest and sympathy of British souls than the lifeboats whose crews ply their noble work on our rock-bound, shingly, or sand-beset coasts and river-mouths. The general use of these craft belongs to the present century. In 1785, Lionel Lukin, a coach-builder in Long Acre, London, was the first designer of a rude form of what was claimed to be an unsinkable boat for use in shipwrecks. The credit of constructing the first lifeboat has been generally given to Henry Greathead, a boat-builder of South Shields, who was set at work by a local committee, after a dreadful wreck at the mouth of the Tyne in 1789, when all hands were lost close to the shore, before the eyes of thousands of pitying, powerless spectators. This ingenious man devised a curved form of keel, and on this basis reared a boat 30 feet long and 10 feet wide, with ten oars double-banked. Craft of this kind were quickly placed at various points of the coast, and some hundreds of lives were thus preserved. A great advance for the benefit of mariners was made when, in 1824, the association was formed which has long been known as the Royal National Lifeboat Institution. The king and his brothers, the church hierarchy, the peerage, and the gentry supplied patrons for the new scheme, and for many years the work of providing and maintaining lifeboats was well performed. The institution was somewhat declining when, in 1849, another disaster at the mouth of the Tyne drew public attention at once to the duty of aiding shipwrecked sailors and to the two main defects of the existing form of boat. There was no means by which the craft could free itself of water, or right itself in case of upsetting. The South Shields life-boat, built on Greathead's plan, went out to a wreck in December of the year above-named, and, being overthrown by the sea, drifted ashore bottom upwards, with the drowning of twenty out of two dozen pilots that had formed her crew. The Duke of Northumberland, an admiral of the royal navy, in 1850, offered a hundred guineas for the best model of an improved lifeboat. Out of nearly 300 competitive plans, the successful one was that devised by James Beeching of Great Yarmouth, in Norfolk, who constructed the first self-righting boat, 36 feet long, and propelled by 12 oars. This model, with the aid of government shipwrights, and through many suggestions from various quarters, was afterwards greatly improved, and the addition of a transporting-carriage has been

of vast service in conveying boats to parts of the coast at some distance from their stations, and in launching them from open beaches amid high-running surf. The boats are manned partly by men in the regular pay of the Institution, chiefly by crews of registered volunteers from the resident coastguard, fishermen, and boatmen, with fees of 10*s.* by day and £1 by night for each man, on every occasion of going afloat to save life from wrecks. The funds of the Institution provide these last payments. About three hundred lifeboats, on the coasts of the British Isles, are now managed by the R. N. L. I., which also grants rewards for the saving of life to the crews of shore-boats, fishing-boats, and any other craft, and to those who successfully resort to any other means of snatching human beings from the jaws of the sea. The latest invention in the way of these vessels is a steam lifeboat launched in 1890, built at Blackwall by Messrs. Green, made of steel, and driven by a turbine wheel. Up to the end of 1892, the lives saved on our coasts, under the auspices of the Institution, amounted to 37,265.

The modes of saving life at sea include the carrying of boats on board ships, with life-buoys, life-belts, buoyant pillows and mattresses, life-jackets made of india-rubber cloth, and water-tight hollow seats in the form of long bench-like boxes, with ropes attached, carried on the decks of steamers for excursionists and other passengers. An Act of 1888 compels, under very heavy penalties for default, the carrying of due appliances of this class by the master of every British ship. When a wreck is off shore at a place where no lifeboat is stationed near at hand, or in cases where the lifeboat is engaged elsewhere, or from rough sea or strong currents is unable to reach the scene of needed rescue, effective use is often made of mortars or of rockets. In 1807 Captain Manby invented his life-mortar, firing a shot with curved barbs to lay hold of the rigging or bulwarks of the helpless vessel, and carry a rope to the people on board. The rocket-apparatus sends from the shore a light line for the crew on the vessel to seize, and thereby pull in a thicker rope, and then a hawser, along which the people can, one by one, be hauled ashore with a life-buoy, or in a cradle, or, several at a time, in a life-car of American invention. The Board of Trade has charge of the Life-Rocket service, which has more than 300 stations in Great Britain, with 7 cliff-ladder stations, and annually

saves some hundreds of lives through the agency of the coast-guard.

In connection with maritime affairs we may here note the improvements made during the century in the shape and construction of anchors. Lieutenant Rodgers, in 1838, patented a hollow-shanked anchor with the advantage of increasing the strength without additional weight, and inventors named Porter and Trotman introduced movable arms and flukes, pivoting about the stock instead of being fixed thereto. The anchor, on reaching the ground, takes a readier and firmer hold, and there is far less chance of the cable becoming fouled on the upper fluke when the anchor is raised. In 1852, after an elaborate trial of many different kinds of anchor, the Admiralty awarded the highest place to Trotman's, as improved from Porter's form with movable arms.

The labour of outwearied human legs in mounting endless stairs of the tall modern warehouses, of piles of domiciles arranged in flats, and of huge hotels, aspiring skywards in their dozen stories, has been mercifully met in handworked hoists for raising goods, and in lifts or cages, both for goods and persons, raised and lowered in a shaft either by ropes or chains atop, wound on a drum or barrel, or through hydraulic pressure, applied directly, or by means of chains and ropes.

The toil of stitching has, during the latter half of the century, been revolutionized in the appliance, of which many millions are in use, known as the sewing-machine. The idea was first conceived in England in the eighteenth century, and some rude attempts, for working embroidery, were made. In 1790, an English patent was granted to an inventor named Thomas Saint for a machine that made a loop-stitch in the quilting and sewing of boots and shoes and other articles. Improved machines appeared in France and England and the United States, but, save as regards shoe-making, the efforts of inventors were thus far directed only to such minor work as glove-stitching, embroidery, and basting, or loose tacking for a temporary purpose. A firm and durable style of work, or at least the basis of the coming boon for makers and for wearers of all kinds of fabrics in cloth and leather, was due to the ingenious Elias Howe, of Cambridge, Massachusetts, the constructor and patentee of the first lock-stitch sewing-machine, embodying the essential features of the present marvellous and almost perfect

instruments. Howe's contrivance, patented in 1846, was vastly improved by American inventors, Wilson, Gibbs, Singer, and other skilful mechanicians, and this mode of sewing, adapted, in machines of various types, both for domestic and for factory use, to the finest and the heaviest materials, has proved a blessing to many a hard-worked mother, and has greatly cheapened clothing of all kinds for the use of the whole civilized world. The button-hole machine is a wonder of ingenuity that seems, to the spectator of its action, almost possessed of the conscious intelligence of a human worker, taking 1500 stitches per minute, and working 6000 button-holes per day.

It would be an endless task to mention and describe the applications of machinery, during the nineteenth century, to labour formerly committed only to human hands. In the washing of clothes, the churning of butter, the ploughing of fields, the reaping of harvests, the making of bread and biscuits, and in a thousand other ways, machinery worked by hand, or water, or steam, or electricity, or compressed air, is continually sparing or assisting human effort, apart from the performances of the great and costly steam-plant used in large factories and workshops for the more important branches of manufacture. Much of this will be hereafter referred to, and we notice here, in addition to the above appliances, only two recent inventions connected with the work of authors and printers. The Type-writer, a machine for producing legible characters on paper without the use of a pen, was of American invention about 1868. Various forms are due to improvers of the original mechanism, whereby the operator either produces in type the words which occur to the mind in composition, or copies manuscript placed before the eye, or takes down matter which is dictated by another. The action of inked types on the paper is effected by means either of two separate movements precluding a high speed in the work, or by the pressure of the fingers on a keyboard somewhat resembling a very small piano, and allowing rapid work for practised hands. The type-setting or composing machine is one in which improvement is being earnestly sought by inventors, in the interest of swift and cheap work for the printing-press. Mechanism of this kind was patented by an Englishman in 1822, but many years elapsed before any composing-room contained any specimen of such machines, existing in various improved forms due to Scottish, English,

German, and American inventors. In one class of machines, pressure on a key-board causes the types to drop along a grooved plate into the composing-stick. In another, the Linotype, there are no separate types used, but a key-board action sets matrices with the letters stamped upon the edge, and the whole line is then cast solid in metal ready for printing.

The mode of preparing food is closely connected with the health and comfort of those who consume it, and people in our great towns, dining away from home at their own charges, are greatly concerned in the existence of suitable public places for their needs. There can be no doubt that great improvement has, during the nineteenth century, come in the art of cooking, and that the people of the British Isles have herein derived much benefit from Continental sources. The famous Frenchman, Alexis Soyer, who held a post, in 1830, in the kitchen of the French minister, Prince Polignac, and was chief cook at the Reform Club, in London, from 1837 to 1850, was not only a man of great abilities in his special line, but by his personal influence and his published works did much for the cause of economic, scientific, and tasteful cookery in this country. The employment of gas has been of vast service in cleanly, efficient, and economical cooking. At the great clubs and hotels, this method of preparing food is very largely developed, and in households of every class gas-stoves for this purpose, as well as for heating rooms, are ever being more extensively used. The turning of a tap provides hot water within a few minutes, and only those who have adopted these household blessings can understand the advantage of dispensing, on a wintry morning, with the immediate need of lighting the kitchen-fire, or of the entire disuse of the cooking-range either when severe frost brings the risk of explosion, or when sultry heat renders even the gas-stove an infliction to the dwellers in the kitchen. The subject of cookery, in which our female population, in English town and country alike, have for ages evinced a painful and wasteful ignorance, now has its place in the programme of instruction given at the Board-schools of the principal towns.

All men of middle age, dwelling in London or in any of the largest provincial towns, can appreciate the great advance made since the earlier years of Victoria's reign, in the means of solid refreshment for the hungry citizen dwelling in the suburbs, and spending the day in town on the calls of business or pleasure. The

metropolis may, under this head, be taken as an illustration of the contrast between the present and the past. The "City-man", indeed, was always well provided with excellent taverns or dining-rooms, where a steak or chop, of the best quality in itself, and cooked to perfection on gridiron or grill, with the finest accessories in solid or liquid form, gave him a meal that, for substantial excellence, was worthy of a king. Within the Lord Mayor's limits, there were taverns well known to initiated souls for admirable fare of a special kind. The fish-dinner in a court off Cheapside, completed by the best example of a vanished edible, the old double-Gloucester cheese, and followed, if the guest desired, by the rarest rum-punch in the British Isles, was one to which a chance-visitor was sure to return. The "Cheshire Cheese", in a court adjacent to Dr. Johnson's Fleet Street home, had a fame derived from an incomparable steak-and-oyster pudding. The "Cock", in Fleet Street, has passed away from sight, but abides both in the memory of some ancient men, and for readers of Tennyson's minor poems. Outside the City, the wandering sight-seer, far from his hotel or other lodging, had small choice of places for a mid-day meal. There were dirty "cook shops", confectioners' counters, hotels where he might take luncheon or dine at a heavy rate, but very few decent eating-houses where fare would be at once both cheap and good. The great change came in the rise and progress of restaurants. The name, like the thing, came from the people styled by Mr. Micawber "the lively Gaul". The first French Revolution, in 1789, may be taken as the birth-time of these useful and agreeable institutions. The ruined nobility, many of them doomed to perish on the scaffold, while more were destined, as the *émigrés*, to lengthy exile, discharged their cooks, and threw upon the world many of the most skilful artists in the preparation of food. Of these men, the more enterprising opened public refreshment-rooms, whence the practice of superior cookery was spread. The restaurant became a patent and popular fact, exported in due time beyond the Channel. At the present day, in all our larger towns, excellent meals, admirably served at a moderate charge, may be obtained in houses of this class, opened by British, French, and Italian caterers.

In the later Georgian era, the highwayman of the stories dear to youth, robbing travellers by stage-coach or by post-chaise, with his levelled pistol, and "stand and deliver", was fast approaching

the extinction caused by efficient police and, especially, by the change of travel from coach-road to rail. The footpad of the towns, the street-robber, found his means of livelihood sorely curtailed by the lighting of gas-lamps and by the enrolment of new guardians for urban dwellers. In the years just succeeding Waterloo, the police-system of London, if "system" it can be called, was such that a committee of the House of Commons declared, in their Report, that a foreign jurist, simply examining the facts concerning crime and the means of its prevention or punishment, might well believe that "it was craftily framed by a body of professional depredators, upon a calculation of the best means for obtaining from society, with security to themselves, the greatest quantity of plunder". The metropolis was divided into many petty independent jurisdictions, jealous of each other, without any general control to cause an approach to unity of action. Thieves and thief-takers caroused together in dens called "flash-houses", on terms of good fellowship, and the "perfection of imbecile wickedness", in the words of Miss Martineau, was reached in the fact that the police-officers of that day often forbore to arrest a known criminal for a petty offence, in the hope that he or she might be guilty of a "forty-pound crime", or, in other words, a crime for the detection of which the state awarded, on conviction of the offender, the sum of forty pounds. This atrocious system received a fatal blow in 1816, when three of the "peace-officers" were proved to have conspired to induce five men to commit a burglary for the purpose of obtaining the "blood-money" upon their conviction. The reform of the police-system in the British Isles came with the accession to office, in 1829, as home-secretary for the second time, of that first-rate man of business, apart from his claims as a statesman, Sir Robert Peel. The "Charleys", or watchmen of the streets, decrepit old men, sheltered in a kind of sentry-boxes which the young "bloods" of the period, or the medical students, full of drink and frolic, delighted in overturning on inclement nights, with the poor old fellows inside, now retired into private life. The famous New Police, the men in blue uniform, carrying a heavy staff for defence, and with stiff heavy "toppers" or tall hats, prior to the introduction of the present helmets, became known, in slang complimentary to their distinguished author, as "Bobbies" or "Peelers". Outside the narrow limits of the City of London, where matters remained in the hands

of the Corporation, the former local police-arrangements of the metropolis were abolished, and the new force was controlled by the Secretary of State for the Home Department. This excellent reform set an example followed, under Acts of Parliament, throughout the land. On the London model, the local authorities of cities and boroughs instituted similar bodies of men, and in 1839 and 1840 the appointment of a county-constabulary, subject to the Home-office, was made optional with the magistrates in each shire. In 1856, a compulsory statute made efficient county-constables universal, and the timid wayfarer on suburban roads is cheered by the sight of the mounted patrol, in long blue cloak, and armed with sabre and pistols in case of need. The management of the county-police, under the Local Government Act of 1888, was vested jointly in the justices and county-councils; in boroughs with less than 10,000 persons the county-council also manage the police; the larger towns have their municipal control of their own constabulary. On the whole, the force has proved to be very efficient for its serious duties. The metropolitan police now exceeds 15,000 officers and men, in charge of a district spread over a radius of 15 miles from Charing Cross, with a population of nearly six millions, and of the Dock-yards and the chief stations of the War Department. For the detection of crime, above 300 men, of special experience and skill, are attached to the Criminal Investigation Department. The large amount of valuable property on shipboard and barges in the river is under the special care of the Thames Police, recruited from sailors, and patrolling the river in boats and steam-launches. Most useful work is done by these men in suppressing the "water-rats", or aquatic thieves of every class. The work of the police is, in London, well supported by the magistrates, paid men of good legal knowledge and experience, who preside at fourteen courts in various districts. The City of London, as all the world knows, has its Lord Mayor and Aldermen, sitting at the Mansion House and at Guildhall. In Scotland, the organization of an efficient police in the large towns dates from 1833, under a statute enabling burghs to establish such a force. Glasgow, Edinburgh, and some other great towns have special Police Acts, distinct from the General Police Act of 1862, regulating the force in most Scottish towns, and intrusting the management to commissioners chosen by the assessed inhabitants. The rural police in North Britain, organized by

statute in 1857, is now controlled by the County Councils, who also manage the police of all burghs under 7000 in population. Sheriff-courts, both in towns and counties, deal with a large number of minor criminal cases. In Ireland, the police-force consists of two semi-military bodies, the Royal Irish Constabulary, with about 13,000 men, and the Dublin Metropolitan Police, of 1200, comprising some of the most stalwart constables to be found in the world.

For the protection of property from burglars' hands, as well as from fire, safes constructed of iron and steel have long been largely used. The principle of their manufacture was invented in 1801 by a mechanician named Scott, and an improved fire-safe was patented in 1840 by Mr. Thomas Milner. Messrs. Tann, three years later, devised another method of resisting heat. In these and other fire-proof receptacles for valuable documents, the resisting medium is, in principle, identical. The wall of the safe is composed of two plates of iron, some inches apart, and the space is filled with chemical salts of a very moist character. Various devices for resisting the action of acids, drills, and wedges have rendered the best modern safes impregnable to all attacks of the most ingenious robbers, so far as concerns the piercing of the sides. The wrenching open of the door is prevented by the use of a lock, devised by Messrs. Chubb, which causes bolts to shoot into slots at the top, the bottom, and both sides of the structure. The vulnerable point is the lock itself, the mechanism of which has been most skilfully dealt with by various British and American inventors. The keyless permutation-lock defies the danger arising from lost or false keys, and the safe can only be opened after an indicator has been moved in accordance with a certain combination of numbers arranged before closing it. Many other ingenious devices have been adopted, including the connection of safes with electric alarm-bells.

The places called Safe-deposits, introduced about 1880, are nothing less than small fortresses, constructed in great cities for the benefit of commercial men and private persons who have valuable papers, or plate, or money, or jewels which they wish to place absolutely beyond reach of danger from fire or from robbers, and yet so as to remain readily accessible to the rightful owner. In Queen Victoria Street, Chancery Lane, and St. James' Street, London, there are three of these impenetrable structures, containing thousands of

separate receptacles to which the owner alone, or his duly accredited representative, can obtain access, at certain hours, and inspect, deposit, or remove his own property in presence of a custodian. Brick, some feet in thickness, fire-brick, cement, cast-iron, wrought-iron, steel, doors weighing from two to four tons each, raised and lowered, like a portcullis, by hydraulic power, and at night, armed watchmen walking round, and under, and above the citadel—these are the precautions which, in various combinations, have hitherto defied any attempt of wrong-doers. Apart from treachery in the paid guardians, it seems impossible, to one who has viewed these places, for anything but an earthquake of a violence unknown even in earthquake-regions of the world, to disturb the contents of these newest and most trustworthy forms of fire-proof and burglar-proof construction.

The dishonest manufacturer and trader, too common in this age of severe commercial competition, find their artful devices foiled, in an irritating fashion, by recent legislation on the subject of trade-marks placed on goods. It was early in the eighteenth century that these devices became common in our industrial system. It was not till 1838 that the Court of Chancery began to protect such marks against infringement of every kind, with or without intended fraud. The mark is now the property of the trader who has invented and duly registered the same. The Merchandise Marks Act of 1887, applying to all the United Kingdom, awards severe punishment, by fine or imprisonment, to persons who forge, or falsely apply to goods, these distinctive tokens of quality and make.

For the help of traders against dishonest customers, a class of persons too common in every age since trading began, associations were formed, late in the eighteenth century, composed of merchants, retail dealers, and other persons connected with commerce. Registers of bankrupts and insolvents were made, with particulars of each case, furnished by members to the secretary, so that credit might no longer be accorded to those on the black list. Swindlers and dishonest persons of every class that preys on trade were carefully tracked and exposed. Early in the nineteenth century, the trade-protection movement was much developed, and members of the various societies were supplied with a wide range of information concerning the past and present doings of those who might prove to be doubtful or dangerous persons in commercial dealings. The

recovery of overdue bills and accounts was included in the work of the societies, now more than sixty in number, and due attention is paid to bills before Parliament affecting the interests of trade and commerce.

Chemical science, during the century, has made itself far more terrible than in any past age to the most dastardly of all murderers, the secret poisoner. The department of chemistry called toxicology has been greatly advanced in the researches and observations made as to the action of poisons on the living body, the *post-mortem* indications in persons killed by poison, and the methods of testing for the presence of fatal drugs. The Pharmacy Act of 1868 endeavours to guard the public against both wilful and accidental poisoning, by regulations regarding the seller, the purchaser, and the labelling of the wrapper that contains the poison.

The present century has been marked by an immense development of research and consequent statistics in many new and old departments of scientific and social investigation. We are not concerned here with the discoveries made, but with the means adopted for diffusing the knowledge of results among the general public. The British Association for the Advancement of Science was founded by Sir David Brewster, the eminent Scottish natural philosopher, in 1831, with the aid of many leading men in Church and State, as well as in science, assembled at York. The object of the society was not only to assist the progress of scientific discovery in every department, but to disseminate the latest results of research. The first meeting, after the new body was fully organized, took place at Oxford in 1832, and from that time the Association has been in full and successful operation, with eight separate scientific sections, each under its special committee and president. The annual meetings, with sittings spread over a week or more, have been held in turns at all the principal towns in the United Kingdom, with the accompaniment of soirees, lectures, conversaziones, and other general meetings for the benefit of the non-scientific public who choose to take tickets at a moderate charge. The annual reports, containing the general and sectional addresses delivered by eminent scientific men, with the papers and abstracts of papers read at the meetings, form valuable records, which are presented to societies and to libraries at home and in our colonial dominions. The Archæological Association, in its annual gather-

ings at various parts of the country, with excursions open to all purchasers of tickets, does much to spread a knowledge of British antiquities, in conjunction with a vast number of provincial and local societies.

The Royal Society of London, having its origin in 1645, amidst the din of civil conflict, and incorporated by charter from Charles the Second in 1662, "for the Promotion of Natural Knowledge", published the first number of the *Philosophical Transactions* three years later. This record, forming a history of science of the highest value, now comprises nearly two hundred quarto volumes. In 1800, the octavo serial called *Proceedings* first appeared, and another of the Society's publications, in quarto volumes, the *Catalogue of Scientific Papers*, contains the titles of scientific papers published in all parts of the world from 1800 onwards. This grand work of reference furnishes in methodical form an account of scientific progress during the nineteenth century.

The Royal Society of Edinburgh, incorporated by royal charter in 1783, took the place of the former Philosophical Society in the northern capital. William Robertson, the historian, took the chief part in founding this admirable institution, on the model of the famous Berlin Academy, for the investigation and discussion of subjects in all branches of science, learning, and taste. The *Transactions* and *Proceedings* of the R.S. Edin. are another valuable source of information on the history and progress of science.

The Royal Institution, in London, founded in 1799 by Count Rumford, Sir Joseph Banks, and other learned men, received a royal charter in 1800. Its great public service has been and is the teaching of science and its applications by means of lectures and experiments delivered and conducted by men of the highest distinction in their several departments.

The Royal Geographical Societies, that of London established in 1830, and the Scottish in 1884, publish monthly accounts of their proceedings, and the London Society, at Burlington House, in Piccadilly, from time to time introduces to public notice travellers and explorers of distinguished merit, who make known by addresses the discoveries made in various parts of the world. There are many other associations of learned and scientific men, publishing records of their transactions for the benefit of those who are interested in their special subjects, but we now turn to some in-

stitutions of a more practical and popular character. The Royal Botanic Gardens and Arboretum at Kew, established in 1760 by the Princess Augusta of Saxe-Gotha, mother of George the Third, became a national institution in 1840. Apart from the service rendered by these gardens as a place of innocent and delightful recreation, the authorities supply information of great importance to lovers of botany, horticulture, and arboriculture, as well as to the mercantile world, in the provision of growing and dried specimens of plants, the supply of seeds, the making known of the best methods of culture and care, and of foreign plants and woods that may be valuable for manufactures and trade. The Nautical Almanac Office, a government-department, issues for marine use the invaluable and indispensable publication from which it derives its name. This work, projected by a former astronomer-royal, Dr. Maskelyne, and first published for 1767, was revived, in a more accurate form, in 1834. The information given to navigators is based upon the calculations made at Greenwich Observatory, and the book is issued four years in advance of the year to which it refers, so that the data may be ready for use in the most distant parts of the world, for voyagers far away from the means of procuring a new copy. The Meteorological Office in London, about 1860, began to send out to the ports of the United Kingdom, by telegraph, the "storm-warnings" instituted by Admiral Fitzroy. These efforts to serve mariners by signalling the kind of weather which might be expected in the seas outside their harbours of safety were at first treated with some ridicule, but they have proved of great value, with the advance of scientific observation and deduction, and the system has grown into the daily weather forecasts for eleven separate districts of the United Kingdom. We see these weather-prophecies in our daily newspapers, and we all know the very large percentage of approach to perfect accuracy.

A serious investigation of public documents in the shape of rolls, records, writs, decrees, and such materials for history, written in Norman-French, Latin, and English, was made by a committee of the House of Commons in 1800. The work of that body was carried on by a commission renewed at intervals up to 1831, and the commissioners issued many valuable publications derived from the above source. About 1834, an inquiry was begun as to the materials for British history to be found in the Vatican and other

foreign libraries, and agents have been employed for many years in this work, the results of which have either been published, or can be found at the British Museum or in the Record Office. An Act of 1838 conferred the guardianship of the English records on the Master of the Rolls, one of the superior Judges, and, under his authority, a Deputy-keeper of the Records has charge of the department. Catalogues, calendars, and indexes of important documents are printed for sale, and since 1858 more than 200 volumes of *Chronicles and Memorials of Great Britain and Ireland* have been issued. The Historical Manuscripts Commission, closely connected with the Record Office, has put forth since 1870 many volumes of reports, with specimens and abstracts, on the contents of private libraries and muniment-rooms all over the British Isles. Thus does modern care and enlightenment, in this form an invention of the nineteenth century, spread abroad the knowledge of the past. The Public Record Office, a handsome and professedly "fireproof" building in Fetter Lane, Fleet Street, London, is the place of deposit where Domesday Book and countless other valuable and interesting memorials may be inspected and consulted. The Scottish records, under the charge of the Lord Clerk Register, a high officer of state, were in 1787 deposited in the new General Register House at Edinburgh, from which, since 1811, the publication of important documents has proceeded at intervals. In Ireland, under the Public Records (Ireland) Act of 1867, a similar work has been performed.

The work of the Ordnance Survey of the United Kingdom, described in 1867, by French experts, as "a work without precedent", and one that ought "to serve as a model for all civilized countries", belongs almost wholly to the present century. It was undertaken by the government in 1784 with a view to the construction of accurate and detailed maps of the British Isles. The first such survey had been completed in Scotland in 1755, mainly under the direction of that distinguished officer of Royal Engineers, Major-general Roy. This earliest, and one of the ablest, of British geodesists, or earth-measurers on an extensive scale, by scientific means, was a native of Lanarkshire. The result of the northern survey was never published. The general survey, begun on the scale of one inch to the mile, was completed, with variations to a 6-inch scale for Ireland and for some Scottish and

English counties in 1852. In 1863, new scales, varying from one inch to a mile for the general map of the kingdom, to nearly eleven feet to a mile for towns, were selected, and for several years now a re-survey of England on the 25-inch scale has been in progress. The public have thus been supplied with accurate maps of parishes, counties, and districts, both in large sheets that can be joined together, and in forms reduced by photography from the higher scales. The work of the Royal Engineers and civilians engaged on the survey was often of a romantic, interesting, adventurous, and, sometimes, of an arduous and painful character. Privation and exposure were endured during marches in search of fit stations for survey in the Scottish Highlands and in the wilder parts of Ireland. There were wearisome watchings, for weeks on end, by daylight, from the tops of high church-towers or from mountain-summits, as they waited for a signal-flash at some far-distant station. Now and again, during months of isolation in camp upon a rugged peak, the surveyors were exposed to snowstorms, and to furious gales which levelled their tents with the ground and endangered the great and valuable instruments employed. Amidst these difficulties, the work was performed with a vigilance and accuracy beyond all praise. The Geological Survey of the Kingdom, begun in 1832, and still in progress for northern Scotland, has furnished valuable maps, on the 1-inch and partly on the 6-inch scale, with sheets of horizontal and vertical sections, descriptive accounts, and monographs on fossils.

The Statistical Society of London was established in 1834, for the purpose of collecting and arranging facts bearing on the social, moral, and material condition of the people. The principles laid down by Quételet, the eminent Belgian statistician, who died in 1874, have been followed with great advantage to the method of deducing sound conclusions from classified and compared phenomena numerously and widely observed. The benefit to social and political economy has been conspicuous. In connection with this subject, bare justice requires eulogistic mention of Dr. William Farr, F.R.S., formerly superintendent of the Statistical Department of the Registrar-general's Office in England. Prior to the Registration Act of 1836, the only regular, and these but very partial and imperfect, records of facts concerning birth, marriage, and death were the parish-registers of baptisms, marriages, and burials insti-

tuted by the Tudor statesman Thomas Cromwell, in 1538, when he was Vicar-general under Henry the Eighth. Little regard was paid to the regulations on the subject, and in 1597 Elizabeth issued a stringent order for more careful entries by incumbents, and for copies of the same to be annually sent to the bishop of each diocese. In 1812 an Act ordered the preservation, arrangement, and alphabetical indexing of all names in the registers. Neither the parish-clergy, however, nor the bishops had ever paid due heed to the matter. The registers even of the eighteenth century are very imperfect, and in 1801 it was discovered that in 11,000 English parishes but 812 registers dated from 1538. The statute of 1836, applicable to England and Wales, made a very great change. A general registry-office was provided at Somerset House, in London, with a Registrar-general at the head of the whole system. Local registrars in districts of every Poor-law Union send in quarterly returns to the superintendent of their district, who transmits them to the central office, for preservation and inspection on payment of a small fee. A complete record of births, deaths, and marriages is thus obtained, and an annual abstract of the returns is laid before Parliament. The Irish system was laid on the same lines in 1863. In Scotland, an Act of 1854 appointed the Deputy-clerk Registrar to preside over a system resembling that of the sister countries. Dr. Farr, already in high repute through his article on medical and vital statistics in M'Culloch's *Statistical Account of the British Empire*, an article which laid the foundation of sanitary science, was at once appointed Compiler of Abstracts in the new General Register Office. His official career, extending over more than forty years, displayed a mastery of the art of lucidly marshalling facts, and of all the resources of method and numerical investigation. He created and developed a national system of vital statistics, which has done wonders for the progress of sanitary reform, and has, practically, been adopted in all other civilized countries. His Life-Tables, based on the Registrar-general's Annual Reports and on Census enumerations, were of great service to the government in preparing the scheme of Post-office insurance.

In the first year of the nineteenth century we had, for the first time in British history, a regular and trustworthy census of Great Britain, or an enumeration of the inhabitants, with various particulars concerning them. The census first held in 1801 became

decennial. In Ireland, the first attempt was made in 1811, but the Irish enumeration of 1831 was the first whose returns could be considered trustworthy. The process was extended, in 1871, to the whole British Empire. A special Act directs the taking of each census, which is conducted through the machinery of the Registrar-general's department. In 1881, more than 30,000 enumerators were employed in England alone, and the work of tabulation of the particulars in the schedules left at every house for filling-up, occupies a host of clerks for more than two years. The particulars required have varied from time to time. In 1821, the first attempt was made to get at the age of each person, but it was left optional, and the return was, in this point, very imperfect. In 1851, the inquiry extended to compulsory information regarding occupation, age, birthplace, relationships (of persons in each house) to head of family, civil condition (married, single, &c.), and blindness, deafness, and dumbness. At each census since 1811 the number of houses "building" has been returned, as an indication of increase in prosperity and population or of a downward tendency. In 1881, inquiry as to imbeciles and lunatics was made in every household. A high degree of accuracy as to the number of people living in the British Isles on the day specified in each Census-act is reached by ingenious modes of estimating houseless persons, those engaged in travelling, and those who may be living in barges on canals, or on shipboard in port. We may conclude this account of modern improvements in acquiring and disseminating valuable knowledge by a reference to two works of widespread utility, mines of information in a shape unknown to the earlier decades of the nineteenth century—the very comprehensive *Whitaker's Almanack*, in its larger form, and the admirable *Statesman's Year-book*.

CHAPTER III.

FREE TRADE.

Increase of population and of wealth—William Huskisson's efforts to abolish trade restrictions—Sir Robert Peel's financial reforms—History of the corn-laws—The "sliding scale"—Anti-corn-law League—Richard Cobden and John Bright—A touching appeal—Prominent leaders of the League—Its earnest labours—The Free Trade Hall in Manchester—Ebenezer Elliott—The opponents of free trade—Change in Peel's views—Serious condition of the country—Abolition of the corn-laws—The League dissolved—Repeal of the navigation-laws—Mr. Gladstone's successful financial measures—His eulogium on Cobden—Benefits conferred by free trade.

The growth of our material resources during the nineteenth century has been far more rapid and extensive than in any equal period of British history, vastly exceeding, as it does, the proportionate amount connected with increase of population. In general terms, the number of people in Great Britain (England, Scotland, Wales) has about tripled from 1801 to 1894. The increase of wealth from 1840 to 1887, which was, indeed, the period of most rapid growth, was 124 per cent, or three times greater than that of population. The yearly accumulation of wealth between 1840 and 1860 averaged 64 millions sterling; between 1860 and 1887, this average rose to 143 millions. For the causes of this enormous advance we must look to the economical revolution known as Free Trade; to the development of thrift; to the growth of manufactures; to the increase of facilities for navigation, and to the progress of British commerce, which are jointly due to steam and to the removal of fiscal burdens. Taking these subjects in the order now given, we come first, in dealing with freedom of trade in the present century, to the name of William Huskisson. This pioneer in the work with which the names of Richard Cobden and Sir Robert Peel will be for ever associated was a supporter of William Pitt, under whom he became, in 1804, Secretary to the Treasury. Acquiring skill and repute in financial affairs, he was, in 1823, elected M.P. for Liverpool, and appointed by Lord Liverpool, the premier, to the important office of President of the Board of Trade. Two years later, he was admitted to the Cabinet. In the session of 1823, Huskisson at once advocated a broader system of commercial policy than had ever yet been proposed by

a government official. He repudiated the old belief that our commercial and manufacturing prosperity rested upon the exclusive employment of British shipping, upon prohibitory and restrictive duties at the Custom-house, and upon the "Balance of Trade". His Reciprocity of Duties Bill, carried through Parliament in the same year, empowered the King in Council to place the shipping of any other country on an equal footing with our own, whenever that country granted a like favour to British vessels. Arrangements on these terms were quickly made, to mutual advantage, with Prussia, Denmark, and Sweden, and with Hamburg and other northern free towns. The trade between British colonies and foreign lands was also much modified in the direction of free commercial intercourse. These blows at the old Navigation-laws were followed up, in 1826, by the removal of the prohibitions on imported silk-manufactures, and by a large reduction of the duties on raw and spun silk. The knocking of these nails into the coffin of Protection was accompanied by the usual groans and prophecies of coming ruin from the blind, well-meaning advocates of the restrictive, selfish policy which aims at national welfare through a jealous interference with the prosperity of other peoples.

The next great name in this connection is that of Sir Robert Peel. That enlightened, prudent, honest, high-minded, slowly-progressive statesman, under whom the old Tories were developed into the modern Conservative party, entered the House of Commons in 1809, the year of Mr. Gladstone's birth, and by degrees gained credit as an economist and financier. After a brief term of office as premier in 1834–35, he became Prime Minister again in September, 1841, with a majority of ninety in the Commons, and, with Mr. Goulburn as his Chancellor of the Exchequer, he at once dealt firmly with the financial deficit that confronted him. An income-tax of sevenpence in the pound was imposed on all incomes that exceeded £150 a year, and he then sought benefit for British trade and manufactures in a large revision of the customs-tariff. There were countless vexatious duties which greatly hampered the manufacturer, and restricted the comforts of the people, while they brought no adequate compensation in the shape of gain to the revenue. Out of about 1200 articles paying duty, a total abolition or a large reduction was made on some 750. In 1843, restrictions on the exportation of machinery, which had injured our trade for

the benefit of that of Belgium, were abolished, and in 1845 Peel carried a large reduction of the duties on sugar produced by free labour in foreign countries and British colonies, with the abolition of all export-duties, and the exemption from Customs-payment of 430 articles of raw material, including cotton. The duty on glass was also remitted. In the following year, a large reduction of duty was made on the two chief remaining raw materials that were taxed, timber and tallow; all duties on coarser articles of wool, cotton, and linen manufacture were withdrawn; those on finer qualities were reduced, and the duty on silk, which was a chief temptation to smuggling, was reduced from 30 to 15 per cent of its value. The general result of Peel's financial reforms, apart from the corn-duties, was that manufacturing production and the revenue were alike advanced, and a greater demand for labour, with an increase of popular comfort and content, arose in the country. The abolition or lowering of duties had included articles so important to the public welfare as cattle, sheep, pigs, salted meat, butter, eggs, cheese, lard, dye-woods, and drugs.

The great reform was, of course, the cheapening of bread by the abolition of the duty paid on imported corn. The restriction of the grain-trade dates very far back in British history. In 1360, under Edward the Third, the English grower was forbidden to export corn. In 1436, exportation was permitted when wheat was not higher than half a mark (6*s.* 8*d.*) per quarter. In 1463, for the first time, as it appears, importation was prohibited so long as the home-price was below the above standard. In 1562, exportation was allowed, when the price fell below 10*s.* per quarter. In 1689, export-duties were finally abolished. In 1670, importation of corn into England was forbidden until the home-price reached 53*s.* 4*d.*, and a heavy duty was laid on importation at a price above that amount. There were many changes during the eighteenth century. The modern history of the question begins with 1815, when what is generally understood by "the Corn-law" was passed, prohibiting any importation of foreign corn so long as the home-price remained below 80*s.* per quarter. This was the "protection" afforded to the landed interest by a parliament mainly composed, in both Houses, of landowners. Wide-spread distress among the labouring classes, arising in some measure from the operation of this law, produced the disorder which has

been described in another section of this work. In 1828, the device called the "sliding-scale" reduced the import-duty as the price of grain increased, but the only effect was to make the corn-trade a series of gambling transactions, and the market-price of wheat was seldom less than 80*s.* per quarter, or above three times the value in 1895. In 1842, Sir Robert Peel modified the sliding-scale, reducing the tax and improving the system in favour of cheaper bread, but maintaining the principle. In effect, the law still was that, for the benefit of the landowners, the people were to pay 1*s.* for the 4-lb. loaf.

We must now turn to some account of that most famous association, of cumbrous name and consummate energy and power, the Anti-corn-law League. In 1836, a combination in favour of free-trade in corn, or for the repeal of the Corn-laws, was made by some of the "philosophical Radicals", headed by George Grote, Joseph Hume, and John Arthur Roebuck. The League, however, had its origin in 1838 with seven merchants of Manchester, a circumstance which caused the Free-trade party to be long distinguished as "the Manchester School" of politicians. Among its earliest were also its two greatest adherents—Richard Cobden and John Bright. Cobden, the self-educated son of a thriftless Sussex yeoman, early showed great skill in business as a commercial traveller and a dealer in calico, and then became, in 1831, a calico-printer in Lancashire. In 1838, after carrying in the Manchester Chamber of Commerce a motion to petition Parliament for the repeal of all corn-duties, he joined the League, and delivered lectures all over the country in behalf of its principles and aims. His speeches outside Parliament, and in the House of Commons, which he entered in 1841 as M.P. for Stockport, were unrivalled for clear, persuasive, convincing power of exposition and illustration. His amiable, earnest, honourable character in all the relations of life gave increase of force to his political exertions, and he won a pure and undying fame as the chief among all the champions of Free Trade. Mr. Bright, born near Rochdale in Lancashire, son of a cotton-spinner and manufacturer in that flourishing town, took an early interest in great public questions, and, joining the League in 1839, soon became one of its leading members. The friendship that existed between Bright and Cobden is one of the fairest ornaments of our political history. Most touching, as related in Bright's

own words, was the origin of his active connection with the League. His young wife was lying dead in his home when Cobden came, and, after uttering such words of comfort as he could, cried, "There are at this moment, in thousands of homes of this country, wives and children who are dying of hunger, of hunger made by the laws. If you will come along with me, we will never rest until we have got rid of the Corn-laws." The appeal was nobly answered by the man bereaved of his nearest and dearest friend, and he went up and down delivering speeches which laid the foundation of his unsurpassed oratorical fame. In July, 1843, he entered the House of Commons as M.P. for Durham city.

The cause of repeal had been already urged in the House of Commons by one of its ablest and most earnest advocates, Charles Pelham Villiers, a member of the Earl of Clarendon's family. This gentleman, becoming M.P. for Wolverhampton in 1835, represented that town in unbroken succession for a period somewhat exceeding sixty years. The strength of the opposition to the League within the walls of the Commons may be judged by the fact that Mr. Villiers' motion, in 1842, for the immediate and total repeal of the Corn-laws was beaten, in a House of less than 500 members, by a majority of 303. Mr. Milner Gibson, who became M.P. for Manchester in 1841, was another distinguished supporter of free-trade doctrines. One of the most powerful orators on the League platforms was the Unitarian minister, William Johnson Fox, son of a small farmer near Southwold, in Suffolk. His rhetoric was bold and impassioned in the highest degree, and acted with electric intensity of effect upon vast miscellaneous audiences in London and other towns. Failure in parliamentary motions only made the members of the League more resolved to create a public opinion throughout the land which should ultimately carry their cause to a triumphant issue. No pains, no kind of effort in print or word, no expenditure of coin, was spared. They thoroughly believed in themselves and their case, and they did wonders in the propagation of belief. In 1843, by subscription and in the profits of bazaars, £50,000 was raised. In 1844, double that sum was provided. In 1845, a quarter of a million sterling was contributed, of which vast sum £60,000 were subscribed in an hour and a half at a great meeting held at Manchester. The Free Trade Hall was erected in Manchester on ground belonging to Cobden, and bestowed by

him on the council of the League. Covering part of the scene of the "Peterloo" trouble in 1819, the stately hall in which the people's rights were urged with stirring eloquence and invincible logic hid from view the ground where tyrannical rulers had once shed the people's blood. The central body at Manchester was aided by hundreds of local associations, and a thoroughly organized scheme of agitation, by able paid and volunteer lecturers, by leaflets, tracts, pamphlets, and other like matter, spread from one end of the country to the other. The introduction of railways and of cheap postage greatly favoured the work of the League, and a sturdy and intelligent public opinion was gradually formed and directed against every kind of protective duty. Every clergyman, every corporation, every poor-law guardian received a special invitation to join in the movement. The Muse of poetry herself flew to the help of the pauperized and long-suffering people. Ebenezer Elliott, born of mixed yeoman and moss-trooper ancestry at Masbro', near Rotherham, in Yorkshire, worked in his father's foundry from his 16th till his 23rd year. Dull-witted as a lad, and on the road to be a "sad drunken dog" in manhood, he was led into the fields as a lover of flowers by the picture of a primrose in Sowerby's *Botany*. A poetic nature woke to life, and the writing of much verse preceded his entry into the iron-trade of Sheffield with fair success, enabling him to retire with a modest competence in 1841. Elliott the "Corn-law Rhymer" was the poet of the movement, and his rugged ballads, harsh in much of the thought which they expressed, exerted the power belonging to the genuine outpouring of a soul that burns with a sense of oppression wrought by unjust laws on the singer's fellow-men. Sometimes wailing and pathetic, now and again bursting into wrathful utterance, the verses of Elliott went home to the hearts of thousands that could feel, though they might be slow to apprehend more logical effusions. It is no part of the business of this work to gibbet by name the opponents of Free Trade or of any other beneficial work done for the nation in the nineteenth century. In general terms, we may say that for sheer stupidity and selfishness the utterances of the least favourable specimens of the men called "Protectionists" have rarely been equalled in political history. Of the public press, the *Times*, then a real power in the country, strongly supported the repeal of the Corn-laws. The *Morning Post*, on the other side, deplored the

spectacle, witnessed during a debate in the Commons, of "the landowners of England, the representatives by blood of the Norman chivalry, shrinking under the blows aimed at them by a Manchester money-grubber". The "money-grubber" was Cobden, who had been declaring that if "a copy of the statutes were sent to another planet, without one word of comment, the inhabitants of that sphere would say at once, 'These laws were passed by landlords'".

The progress of the cause in the Commons was slow. In May, 1843, Mr. Villiers' motion for a Committee on the Corn-laws was defeated by a majority exceeding 250: in June, the majority was largely reduced, but this was in a much thinner House. The great gain was that Cobden, combined with the progress of events, had converted Peel himself to the views of the League. The state of the people was very serious. In 1841, incendiary fires had blazed in many parts of the land, when the starving peasants, unable to buy bread, and seeing prices rise as the wheat lay in the stackyard, kindled the ricks and sent up to heaven in smoke and flame the food with which they might not appease the pangs of hunger. Famine was rife, and everywhere the gaze met gaunt, haggard men, shrivelled women, and emaciated children. The widespread use of food less nourishing than wheaten bread was one consequence of the existing Corn-laws. The consumption of potatoes in place of corn lowered the vitality and stamina of the people, and Cobden appealed to "unimpeachable testimony that the condition of the great body of Her Majesty's labouring subjects has deteriorated woefully within the last ten years". It was the Irish famine that brought Sir Robert Peel to legislative action. After a resignation and a return to office, he rose in the Commons on January 17th, 1846, and proposed the speedy abolition of protective duties on corn. The customs-payment on wheat, oats, barley, and rye was at once to be reduced, lowered for three years on a sliding-scale, and finally abolished, save a registration-duty of 1*s.* per quarter, in 1849. These proposals were carried by a majority of nearly 100 through a coalition of nearly all the Liberals with about one-third of the usual supporters of Peel. On June 26th, 1846, the Corn Bill received the royal assent, and the triumph of the League was celebrated at Manchester on July 2nd by the holding of its last meeting. With their coffers yet containing £200,000 Richard Cobden moved the resolution which quietly dissolved the body whose noble work

was now achieved, whose splendid mission was at last fulfilled. The name of the Anti-corn-law League is inscribed on one of the most brilliant pages of modern history as a proof of what may be accomplished with the weapons of rhetoric and reason, wielded by able, enlightened, virtuous, and courageous men. The results of its work were—to the nation, a cheap loaf; to Sir Robert Peel, immediate political downfall, and a treasure of imperishable fame.

The old exclusive mercantile system, dating from Plantagenet times, had sought benefit for English trade in restricting exports and imports to English vessels. In Tudor and early Stuart days, some difficulty was found in enforcing the regulations. In 1650 and 1651, as already indicated, strict Navigation Acts were aimed at the Dutch monopoly of the carrying-trade from distant countries and between European ports. No foreign ships could trade with any English "plantation" or colony without a license from the Council of State, and no goods could be carried between Asia, or Africa, or America, and England or any of her dependencies, save in English ships, or in the vessels of that European nation of which the merchandise was the actual growth or manufacture. In 1660, these statutes were re-inforced by an Act requiring that the vessels should be British-built and British-owned, and that the commander and three-fourths of his crew should be British subjects. One consequence of these measures was a great increase in the cost of British ship-building, under the pressure of a great immediate demand for new craft. Our plantations, and English producers, were also restricted in their dealings, but the policy did deprive the Dutch of most of their trade, and this country became at last an emporium for the commerce of the world. With changed political and commercial conditions, the importance of the Navigation Acts passed away, and the new political economy of Adam Smith taught British statesmen other lessons than those of restriction. In 1820, the London Chamber of Commerce petitioned Parliament for an inquiry into the existing commercial regulations. They urged that free commercial intercourse between nations tended to their mutual advantage, as they could then supply each other with the commodities for the production of which each was specially fitted. A Committee of the Commons, in their report, laid down new principles issuing, as we have seen, in Huskisson's modification of the Navigation-laws in 1826. In 1846, the operation of the statutes was

suspended, and in 1849 they were repealed as regarded all trade between foreign countries, or our colonies, and the British Isles. In 1854, free trade, as regards shipping, was completed in the throwing open of our coast-trade to foreign vessels. The vast increase of commerce carried on by British ships is a triumphant answer to those advocates of "Protection" who predicted that the new legislation would ruin this country for the benefit of foreigners.

When Peel had passed away both from power and from life, the sceptre of finance came into the hands of his ablest follower, Mr. Gladstone, by whom free trade was carried almost to its utmost possible lengths. Under Lord John Russell's ministry (1846-1852), our markets had been thrown open to foreign as well as to colonial sugar. The Budget of 1853, carried by Gladstone in his first term of office as Chancellor of the Exchequer, reduced the tea-duty from 2*s.* 2*d.* to 1*s.* per pound, greatly reduced the duty upon thirteen articles of food, and wholly removed or much lessened the customs-payment on 256 minor commodities. In 1860, with Mr. Gladstone again at the Exchequer, another new departure was taken in the interest of British manufactures and commerce. His speech, when he introduced the financial proposals for the year, proved the vast benefit conferred by the free-trade policy. In 1842, the annual income of the country had been 154 millions; in 1859-60 it had risen to 200 millions. The increase had occurred in every class, and with the agriculturists it had been greatest. He showed that remissions of taxation had always been followed by increase of revenue, consequent on the growth of trade and commerce. Eulogizing Mr. Cobden for his successful exertions in negotiating a commercial treaty with France, on free-trade principles, he said, "Rare is the privilege of any man who, having fourteen years ago rendered to his country one signal and splendid service, now again, decorated neither by rank nor title, bearing no mark to distinguish him from the people whom he loves, has been permitted to perform a great and memorable service to his sovereign and to his country". A very large reduction was now made in the duties on foreign wines, and duties to the amount of more than one million a year were removed, either by reduction or by abolition, on butter, cheese, eggs, tallow, oranges and lemons, timber, currants, raisins, figs, and hops. The simplification of the customs-duties reached such a point that after 1861 only fifteen articles remained, for

purposes of revenue, on the tariff, or official list of commodities liable to duty. Only volumes of statistics and exposition could demonstrate the benefit of this freedom of trade. It is certain that no home, however lowly, within the British Isles, failed to enjoy increase of comfort and of happiness. The new policy was put to the severest test in 1861, after the failure of our harvest in the previous year. The population had greatly grown since the repeal of the Corn-laws. There were far more mouths to feed, and our home-supplies of wheat were grievously diminished. Then through the open ports the surplus-food of foreign lands came pouring in to make loaves for British tables, and the working class had cheap and abundant food. In 1864, the sugar duties were further reduced, and in 1865 the duty on tea was lowered to *6d.* per pound. Since 1859, British imports from France had more than doubled, and our exports to that country had risen from about four to twenty-two millions.

CHAPTER IV.

THRIFT: NATIONAL, SOCIAL, COMMERCIAL.

Early laws for relief of the poor—Their evil results—The Poor Law Amendment Act—The Poor-law in Scotland—Savings-banks and penny-banks—Marine, fire, and life insurance—Friendly societies—Co-operative and building societies—Moral benefit derived from these societies—Utilization of waste substances—Slag and coal-tar—Arsenical pyrites and alkali waste—Economy of fuel—Preservation of meat, &c.

"A penny saved is a penny gained" is a maxim applicable equally to national, commercial, and domestic affairs. What thrift can do for a nation was wonderfully shown in France during the years that followed the great catastrophe of the Franco-German war. When Thiers, the President of the third French Republic, was seeking to hasten the evacuation of the national territory by the victorious German troops, in paying down at once several instalments, or the balance due on the war-indemnity, he appealed to the people for subscriptions to a loan of eighty millions of pounds sterling. That enormous amount was offered fifteen times over within France itself, and a large portion of the sum sent in came from the savings of the hard-working, economical peasantry or small tillers of the soil.

One of the most difficult problems presented to political and

social reformers is that connected with the wise, humane, and economical treatment of the helpless and impoverished class that exists in all great communities. On the one hand, their business is to feed, clothe, and lodge a number of hopelessly pauperized persons in a way consistent with Christian kindliness, and yet with a due regard to the pockets of the rate-payers. On the other, their aim must be to discourage pauperism, to detect imposture, to aid the deserving with the least possible loss of their self-respect, and to drive the able-bodied back to the ranks of honourable, self-supporting labour. It is certain that the operation of the existing Poor-law is in some respects highly unsatisfactory, and its tendency the reverse of beneficial, but it is ideal perfection in comparison with the system which it superseded in the fourth decade of the nineteenth century. The first statute for the relief of the impotent poor was made in 1388. Under Henry the Eighth, each parish was ordered to provide for the helpless, and set the able-bodied to work. Tramps and "sturdy beggars" were whipped for a first offence; they had their ears cropped for a second; a third entailed hanging as felons and enemies to the commonwealth. Collections of alms were made at church, and a statute of Elizabeth, in 1563, made the contributions of the opulent compulsory by fine and imprisonment. In 1573, compulsory assessment by the justices began. The famous Elizabethan Poor-law, passed in 1601, formed the basis of the system of poor-relief down to the present day. Every inhabitant of every parish was taxed by a poor-rate, and the justices appointed overseers of the poor to act along with the churchwardens. Work was provided for able-bodied paupers, and children were apprenticed to various trades. It was long before this statute was fully applied. In course of time, great abuses crept in. The rate-payers were perforce boarding and lodging many persons capable of self-support; overseers were dishonest; justices were reckless in raising money by rates. In 1723, indoor-relief at workhouses was substituted for allowances made to the poor at their own abodes. An Act of 1782 established workhouse-unions for several adjacent parishes, and appointed poor-law guardians in control of the system. Towards the end of the eighteenth century mischievous changes were made. In 1793, one statute enabled the justices to establish a minimum rate of wages. In 1796, another Act increased the amount of relief, removed the labour-test previously applied at the

workhouse, and allowed relief to be given in aid of wages. Outdoor-relief thus became general, and the poor-laws were made into a wage-paying institution. In 1801, it was estimated that the rates for poor-relief amounted to £4,000,000, and in 1820 that enormous sum, for that age, was nearly doubled. The evil reached an intolerable height of wastefulness, fraud, improvidence, injustice, and oppression. The confusion made, by the system of relief in aid of wages, between the demands of want and the demands of industry brought the whole labouring population, in country districts, under the partial and despotic control of the squire, the clergyman, and the farmer, who, forming a tribunal for the suppression of vice and the encouragement of virtue, reduced the worthy to desperation, and made hypocrites of the worthless. The test of destitution was squalid filth, and the test of character was whining gratitude in return for alms. In the workhouses able-bodied men, at the cost of the rate-payers, were stuffed with food, including good ale. The poor-rate became, in many cases, equal to the rent of the land that was assessed, and even, in some cases, exceeded that amount. A Parliamentary Commission of 1832 revealed these mischiefs, and their report, delivered in 1834, declared the poor-law administration to be "destructive of the welfare of the community". The Poor Law Amendment Act of 1834 divided the whole of England and Wales into 647 unions of parishes, each with a committee of guardians composed of county-justices and of persons appointed by the rate-payers. No relief was henceforth given to the able-bodied poor, except in workhouses established on a very rigorous basis. Before two years had passed, wages were rising and rates were falling throughout the country parishes. Idle paupers were being turned into steady labourers. The rates, in five years, sank from about eight millions to half the amount. Many other statutes have abated various evils, and since 1871 a state department called the Local Government Board has carefully supervised the whole administration of poor-relief. In Scotland, Acts of 1535 and 1663 provided for the maintenance of the infirm poor by taxation. The modern system is based upon a statute of 1845, establishing a general board of supervision, with assessments imposed by parochial boards, one-half on owners and one-half on tenants. The parochial boards are appointed by the ratepayers, and able-bodied persons out of employment have no right to demand relief at all.

Social thrift, in the nineteenth century, has been vastly promoted in the first establishment, or the increased use, of various organizations. Savings-banks, mainly voluntary associations for the receipt of small deposits made by poor persons, and their accumulation at compound interest, were institutions unknown in the British Isles until the last year but one in the eighteenth century. It was in 1799 that the Rev. J. Smith, rector of Wendover, in Bucks, started this mode of frugality for the working class by offering to receive, along with two co-trustees, any weekly sums of not less than *2d.* from his parishioners. If the amount deposited during the year were not diminished before Christmas, he undertook to encourage the depositors by a *bonus* or addition of *1s. 3d.* to each little fund. A like institution was formed near London, in 1803, by Mrs. Wakefield, a wise and benevolent lady residing at Tottenham. These excellent examples were quickly followed among the thrifty Scots. In 1807 the Rev. John Mackay established a savings-bank at West Calder, in Mid-Lothian, and in 1810 another, which was afterwards chiefly taken as a model, was founded by the Rev. Henry Duncan, of Ruthwell, in Dumfriesshire. Four years later, the Edinburgh Savings-bank was set up, and in the two following years the first banks of this class appeared in Ireland and Wales. The system soon spread throughout the kingdom, and in 1817 and 1824 Acts of Parliament provided for the deposit at interest of sums exceeding £50 in the hands of the National Debt Commissioners. Many other statutes have aimed at the good management and safety of these "trustee"-banks, which have been of vast use to the cause of frugality among the working classes. In 1895, over forty-five millions sterling was the amount due to rather more than a million and a half depositors. We may glance in passing at an excellent scheme for teaching thrift in early years by the establishment of penny banks in schools. Of these, in 1890, there were nearly 2500. In 1861, the cause of thrift was taken up by the government in the admirable Post-office Savings-banks, established in connection with the money-order department. Any sum not less than a shilling is received, up to £50 in one year, and not exceeding £200 in all. Interest is paid on every complete pound at the rate of 2½ per cent. Such was the popularity acquired by this system, under which perfect safety for deposits exists in the responsibility of the government, that in 1895 nearly

one hundred millions sterling was the sum due from the Post-office to over six millions of depositors. Further encouragement to thrift has been given by the institution of a system of annuities and life insurance in connection with the Post-office banks.

The system of insurance or assurance against accidents of various kinds that may befall human beings or their property, including life assurance as a means of provision for survivors, is of by no means modern origin. Marine insurance against the perils of the sea for vessels and goods is very old indeed. Fire insurance was known in this country before the Conquest. The earliest known life-assurance policy was dated June 15th, 1583. Many fire-and-life-insurance offices existed in the eighteenth century, and the great marine-insurance association known as "Lloyd's", from the coffee-house in Lombard Street, London, which was once its centre, became largely developed during that period, as the commerce of the country grew in importance. On this subject, which concerns every class of the community, we need only state that the increase of pecuniary precautions against every kind of risk to property and person, and of provision against the inevitable close of life, has been carried, during the nineteenth century, to a point that defies calculation. The Chancellor of the Exchequer encourages life insurance by allowing the annual premium paid on a policy to be deducted from the income-return made for taxation, and the tax on fire-insurance companies was repealed in 1869. "Industrial assurance", connected solely with the wage-earning class, issues life-policies of small amount, with premiums paid either weekly or monthly. One fact on this head will suffice to indicate the enormous business transacted in Great Britain. The Prudential Company alone received in one year (1896), in industrial premiums, more than four and a half millions of pounds.

In Friendly Societies we have, on the part of the working class, another immense development of thrift. These associations for the relief of members, by mutual assurance, in seasons of distress, had their ancient form in the mediæval trade-guilds or craft-guilds. In the modern style, these "benefit-clubs", as they have been called, arose in England and Scotland early in the eighteenth century. In 1793, legislation began to protect and encourage them, and during the Victorian period they have thus been specially fostered and increased. Under various quaint titles—Foresters, Oddfellows,

Druids, Rechabites—and names connected with divers handicrafts, these societies are found in every part of the country. A few statements will show the amount of good work done, and the benefit thereby accruing to the community at large. In fourteen years, the "Manchester Unity" society disbursed to its members, in payments for sickness and funeral expenses, nearly seven and a half millions, and moreover added three millions to its capital. In 1892, these mutual provident associations contained about eight and a half millions of members, with funds, amounting to over 26 millions sterling. It is calculated by good judges that the rate-payers of the United Kingdom annually save, through the action of Friendly Societies in keeping members from the need of Poor-law relief, the sum of two millions. An Act of 1875 appoints public accountants and actuaries to make a quinquennial valuation of assets.

Co-operation for trading purposes is, in a practical and permanent form, an institution of the Victorian age. We are not here dealing with that form of co-operation which consists of an association of men, engaged in some trade or industry, for the purpose of carrying it on solely by their own efforts and thus securing for themselves all the profits of their labours. We refer to those societies whose object is to provide the members, and sometimes also the general public, with the ordinary household necessaries, at as nearly as possible the prime cost. The profits of the "middleman", or series of middlemen, are thus intercepted for the benefit of individuals buying, through their organization, at wholesale charges, and distributing with some slight addition of price for interest on capital and expense of management. The first association of this class which was a real success, and became a model for hundreds of the same kind, was the Equitable Pioneers' Society, established in 1844 at Rochdale, in Lancashire. A score or so of weavers, gathering their modest capital of £28 in subscriptions of twopence and threepence per week, saved from their hard-earned wages, opened a store for dealing, at the outset, only in flour, butter, sugar, and oatmeal. Commercial wisdom, from the first, presided over the management. The interest payable on shares was limited to five per cent, and all profits of the trading were divided among the members in proportion to the value of their purchases. Never was an undertaking marked by a more rapid,

continuous, and brilliant success. In thirteen years' time from the date of opening, the capital amounted to £15,000, the members to nearly 2000, and the annual sales to £80,000. The working men of the Midlands and North of England, and beyond the border, had already spread these institutions far and wide, and, after the example of the Rochdale society, trading was extended to all kinds of goods. The "Rochdale Pioneers" now number about 7000 members, with an annual sale of goods exceeding a quarter of a million sterling. Great Britain now contains about 1400 such associations, with a million members, and transactions to be reckoned by tens of millions of pounds. The cause of co-operation was furthered by the formation of a Central Society, a conference of which, held in London in 1852, laid down principles of high moral value concerning honesty in trading, and unselfish dealing amongst workmen. Twelve years later, in 1864, the machinery of co-operation was improved by the establishment of a "Wholesale Society", with great stores at Manchester and (in 1869) at Glasgow, for the purchase of goods on a very large scale, and a consequent increase of profits to members. Hundreds of local societies became attached to this central organization, with great advantage to their interests, and the movement became a signal and triumphant example of capacity in the working classes for the management of great commercial affairs. In 1869 national congresses of co-operative societies became an annual event in one or other of the larger towns. Two years later, the *Co-operative News* became the press-representative of co-operators, and the organization reached its culminating point in the Co-operative Union, with a regular constitution drawn up in 1873. The Wholesale Society now owns large productive works for boots, shoes, woollen cloth, soap, and other articles, with a small fleet of steamships for continental trading, and great agencies for the purchase and transmission of goods, not only in the British Isles, but in Hamburg, Calais, Rouen, Copenhagen, and New York. The middle classes, in 1866, began to imitate their labouring fellow-citizens by the initiation of the Civil Service Supply Association, followed by the Army and Navy Stores, and other developments.

Another remarkable and most serviceable form of thrift is found in Building Societies, which are joint-stock associations, with a fund raised by periodical subscriptions, for the purpose of aiding members

to acquire small portions of property in land and houses. The Proprietary Societies take money on deposit, paying a slightly higher rate than the usual interest on money at call, and they grant loans for building purposes, repayable by instalments. The Mutual Societies receive weekly or monthly subscriptions, and enable members, by repayments of a loan for purchase of a house or land, spread over a term of years as a rent, to become in due course owners of the property. Statutes of 1874 and later years regulate proceedings in the interest of members, and the system acquired such proportions that ere long the United Kingdom contained over 2100 societies, mostly in England and Wales, with a subscribed capital of about 34 millions, and assets exceeding 50 millions.

The moral benefit of the movements which we have just described is beyond all question. English co-operation had its origin in a species of enthusiasm for the attainment of ideal good to the community on the principles of a truly benevolent socialism whose chief apostle in this country was Robert Owen. His experiments in that direction, in England, Ireland, and the United States, were failures, but the spirit survived, and, combined with a due regard for economical laws, and practical considerations of supply and demand, that spirit gave a valuable impetus to the work so well initiated by the Rochdale weavers. Co-operation recognized the moral law that men should help one another, and live for one another, as being thus alone truly able to live for themselves. The result has been something far higher than mere thrift, or economical advantage, among the working classes. They have thereby learned to act together, to subordinate dissent on details to agreement on principles, to combine for a common purpose in spite of many diversities of opinion on subjects extraneous to that general object. In the somewhat and sometimes stormy debates of the periodical meetings of shareholders, toleration is learnt as a practical duty of life. The very efforts made at economical improvement have produced a change for the better, plainly visible in the dress, the demeanour, the speech of the men who are members of co-operative societies. The rigid honesty of dealing practised at the stores, where the sellers have no interest in chicanery of any kind, but are regardful solely of their duty to give full weight, fair measure, and an unadulterated article, has the happiest moral effect upon those who come within reach of such influence. Sobriety has been promoted

in the existence of handsome markets and shops to which members may resort—shops and markets alike being their own property—their purses filled with the coin once lavished for ill uses in the bar of the tavern. It is a fact that young men in search of prudent and frugal wives consult the books of their own co-operative stores for the names of single female members, not for the sake of their little dowries there invested, but because the possession of such a property is an incontestable proof of their conjugal worth. The life of the masses has been organized and elevated, and their social position vastly improved, by the system which has so happily combined the implanting of moral germs with the bestowal of pecuniary profits.

The chief phase of commercial thrift, a later development of this nineteenth century, is presented in the methods which have been devised for utilizing products formerly flung away as mere worthless waste. Chemical science has been our chief pioneer and assistant in this important work. Out of a large field of acquisition in this department we can cull only a few specimens. Coal-dust is made into a valuable fuel as briquettes, or small bricks, used in household fires and various industries. The dust is mixed with pitch and moulded by pressure and heat into fuel that will remain alight for seven or eight hours, furnishing a heat equal to that given out by coal. The slags or scoriæ of blast-furnaces, mainly composed of a silicate of lime and alumina, may be seen in huge artificial hills around works for smelting iron-ore. About eighteen millions of tons of this rugged hard stuff are yearly produced at the blast-furnaces of Great Britain, and this vast amount of material was, until recent times, regarded as absolutely useless. In the molten state it is now made by steam action into fine filaments called slag wool or silicate cotton, a bad conductor of heat and sound, and therefore useful as a covering for boilers and floors. In other cases, the slag is made into bricks and blocks for building and paving, and from that produced in making steel from one class of pig-iron a valuable manure for land is obtained in the form of phosphoric acid. A striking instance is seen in the products of coal-tar, or gas-tar, in dealing with which modern chemistry has gained one of the greatest triumphs of mind over matter. This thick black liquid, opaque and strong-smelling, mainly produced in the manufacture of gas, was at first regarded as a waste material. Science stepped in, and showed in coal-tar a most abundant source of benzene, a compound

of carbon and hydrogen discovered, in 1825, by the illustrious chemist and natural philosopher Michael Faraday, successor of Sir Humphry Davy in the chair of Chemistry at the Royal Institution. The material is of value to the chemist from its power of dissolving certain substances, and is of great commercial importance as the source of colours for dyeing. It was in 1856 that Mr. Perkin, an English student of chemistry, discovered the exquisite colour known as mauve, and led the way in producing aniline dyes of many a brilliant hue. The vegetable dye called madder has been superseded by alizarin, a product of coal-tar, and this tar, of which our gas-works yearly produce about half a million tons, has now become worth, for some purposes, many pounds per ton. Creasote, for preserving timber against decomposition by damp or by insects, naphtha, various substitutes for quinine, and the strong sweetener, saccharine, are all produced from the once despised coal-tar. Many kinds of materials, once rejected as worthless to mankind, are now employed for the manufacture of paper. Wood, straw, the esparto-grass of Spain, the waste of flax and jute mills, old and torn paper of every description, old ropes, are all now reduced to pulp, and employed in making either mill-board for bookbinding and boxes, or paper for its countless uses in the civilized world. Wherever we turn we see the spirit of commercial thrift, with the aid of scientific and engineering energy and skill, turning once worthless waste into gold. There are trades, indeed, in which, under the fierce competition of modern days, the sole living profit comes from the utilization of the waste products. We have sawdust turned into oxalic acid, and the same material, from the finer timbers such as ebony and rose-wood, moulded into beautiful ornamental shapes. The waste made by cork-cutters becomes linoleum and cork-carpet; the refuse of silk-works, through British ingenuity, has since 1857 been spun into yarn and woven into cloth. The waste of woollen-mills, and all kinds of woollen rags, are either turned into flock for paper-hangings or worked up into yarn, along with fresh wool, which in the end compose cheap fabrics such as druggets and rugs, flannels and friezes, and the cheap "shoddy" clothing for the countless purchasers of ready-made goods in the home and colonial markets.

The substance called arsenical pyrites, or mundic, once seen in vast mounds, lying valueless, round the copper-mines of Devon-

shire and Cornwall, has been lately turned to valuable commercial account. Once sold at from half a crown to fifteen shillings per ton, it now reaches in price to above seven pounds for that amount. The stuff contains from twelve to seventeen per cent of arsenic, largely used in various manufactures as well as in medicine. Our last instance of new wealth due to industrial chemistry is taken from alkali waste. At Widnes, in Lancashire, on the river Mersey, a town containing iron-foundries, works for copper-smelting, and manufactures of soda and soap, there are five hundred acres covered to a depth of twelve feet with deposits of this waste, a mass amounting to ten millions of tons. In its first form, at the time of deposit, this nauseous mass contained a million and a half tons of sulphur, worth about £4 per ton. Six millions of pounds sterling were thrown away, because the alkali-makers had not, in spite of constant and costly efforts, devised the means of at once extracting the valuable sulphur, and of preventing the nuisance due to its presence in the huge deposit, giving off sulphuretted hydrogen to poison the air. In 1889, Messrs. Chance, the alkali-makers, succeeded in first driving off the sulphuretted hydrogen from the waste, and then, using a kiln invented by Mr. Claus, they burned the hydrogen, and deposited the sulphur in a state of almost chemical purity. This ingenious process will be shortly producing enough to supply all our own wants; will save the money now sent to Sicily for sulphur; and will leave sixty or seventy thousand tons for export. In the alkali-trade, the soda itself is sold at a loss, and the deficit is covered by the profit on what was formerly wasted.

Economy of fuel is a species of thriftiness in which great advances have been lately made. At the large factories, expensive machinery is employed to wash and separate the ashes and cinders from the furnaces, and every particle that will burn is returned to the fire. A forced draught of air, worked by jets of steam, is applied to boilers, and the furnaces that heat them are thus made to consume the finest coal-dust. Improvement in steam-engines and boilers has reduced by one-half the consumption of coal per horse-power by the hour. In the making of iron, a like result has been attained, to a striking degree, by the use of the hot-air blast. The heat, in this process, is obtained by utilizing the inflammable gases which, on the old system, blazed away to waste from the top of the furnace.

Modern economy has also produced enormous results in the preservation of meat, fish, vegetables, fruit, milk, and other provisions for conveyance to and sale in distant markets. The account of our Australasian colonies will display this process on an immense scale. The methods employed include refrigeration, or the agency of cold; desiccation, or the complete extraction of moisture; chemical antiseptics, preventing putrefaction; and the exclusion of air. The European markets are supplied yearly with millions of tons of excellent beef and mutton in the shape of frozen carcasses. Dried vegetables are largely used on board ships. Soup-tablets, made of meat and vegetables dried and pressed, afford nourishing food, with the smallest amount of trouble, by the addition of boiling water. The condensation of milk is of boundless service to voyagers by sea, and to all others who are unable to procure the fresh produce of the cow. The exclusion of air from the cases containing cooked foods is an invention probably due, about 1810, to a Parisian named Appert, whose original method was improved by the combined ingenuity of many minds. Large food-preserving factories now exist in Aberdeen and London, the chief British centres of this important industry.

CHAPTER V.

MANUFACTURES.

Output of coal and iron—The Bessemer and Siemens-Martin processes in steel-making—Nasmyth's steam-hammer—Rolling-mills—Immense progress of the iron industry—The Cleveland and other iron districts—The cotton, woollen, and linen trades—Paper-making—Production of salt—Pottery—The Doultons—Introduction of alpaca cloth—Uses of india-rubber, vulcanite, and gutta-percha—The jute manufacture.

On the subject of manufactures and mining, progress in which, so far as mere extent of production is concerned, has naturally kept pace with the growth of population at home and abroad as purchasers, we shall here deal chiefly with new and improved methods employed in some of the most important industries of old standing, and with new trades created by modern British energy and skill. The backbone of industries dependent on steam-power cannot, at present, be anything but coal. The output of this material has grown from about 40 million of tons in 1837 to nearly

five times that amount. The production of pig-iron in Great Britain, which, at the beginning of the century, only reached some hundreds of thousands of tons, at this time exceeds eight millions of tons. It is in dealing with iron and steel that some of the greatest improvements due to modern manufacturing skill have been displayed. It was in 1830 that the hot-air blast for iron-furnaces, invented by Neilson of Glasgow, began to render the service already described. A vast improvement in steel-manufacture came with the process invented by Sir Henry Bessemer, a mainly self-taught man of most ingenious mind, born in 1813 at Charlton, in Hertfordshire. The simple process of forcing a blast of air, at high pressure, through pig-iron in a molten state, drives out the carbon, and converts the iron into a very cheap and useful kind of steel, employed for such heavy manufactures as rails, wheel-tires, rollers, boiler-plates, and plates for ship-building. There never was a grander or more successful invention in metallurgy than this Bessemer process, nor one that gained so great renown for its deviser. The patent was taken out in 1856, and, in the course of a few years, our annual production of steel was raised from 50,000 tons to thirty times as much, while the price fell from £50 per ton to one-fifth of that amount. The other great inventor in the British iron-industry was Sir William Siemens, a native of Hanover, who became a naturalized subject of this country in 1859, was elected F.R.S. three years later, and won the Bessemer Medal in 1875 for his researches and inventions in heat and metallurgy. In 1882 he became President of the British Association, and died at the close of 1883, a few months after receiving a knighthood. This eminent inventor, actively engaged in connection with telegraphy, electric lighting and electric locomotion, produced in 1856 his regenerative furnace, a most ingenious device for saving heat in many industrial processes, especially in the process of making steel. The Siemens-Martin process of steel-making is a successful rival of the Bessemer. Another distinguished name in connection with the British iron-manufacture is that of Sir Isaac Lowthian Bell, F.R.S., a founder of the great Clarence iron-smelting works on the Tees, and a very able writer on metallurgical and chemical subjects.

In the production of wrought iron on a large scale, the steam-hammer has been the great mechanical invention of the nineteenth

century. The idea has been traced to the illustrious James Watt, but no practical step was taken until about 1841, when a steam-hammer was at work at Creuzot in France. The machine had been constructed from a copy, made by two French engineers, of a sketch in the "scheme-book" of Mr. James Nasmyth, proprietor of the Bridgewater Foundry, near Manchester. That ingenious man, born at Edinburgh in 1808, had neglected to patent his idea, and was astounded when he saw it in operation at Creuzot. In June, 1842, he protected his invention, and early in 1843 the first English steam-hammer was at work in his foundry. The great improvement of an automatic contrivance, giving complete command over the force of the blow, and raising the hammer instantly after delivery so that its cold face should not chill the heated mass being forged, was due to Nasmyth's manager, Robert Wilson. Other changes gave increased value to this most powerful instrument.

The economy effected by the Bessemer process has been greatly assisted by improvements in machinery for dealing with iron on the larger scale of manufacture. Rolling-mills with engines working up to 10,000 horse-power take ingots of hot steel weighing over a ton, and in about three minutes form a railway-bar 130 feet in length, drawn out from a mass only 6 feet long. Circular saws then cut the rail into lengths of 30 feet. The power and completeness of the rolling-machinery are finely displayed in the production, within twelve hours, of 400 tons of rails by a single mill. Boiler plates of 13 feet by 10 feet in length and breadth, and weighing nearly a ton, are produced by another form of rolling-mill, and a triumph of the power vested in steam-machinery is displayed in the construction of rolled armour-plates for men-of-war, more than two feet in thickness and weighing nearly 50 tons. The consumption of iron in the United Kingdom for railways alone is such as to confound the mind with its figures. It is certain that for the railroads themselves more than 12 millions of tons of pig-iron, now superseded by steel, have been worked up, and about 7 millions of tons more for the locomotives, carriages, and waggons, while half a million of tons at least are annually needed to replace the wear and tear of rails and rolling-stock. The use of iron for ship-building, which only began on any extensive scale about 1840, has vastly increased the consumption of this king of metals. During

THE 40-TON STEAM-HAMMER AT WORK IN WOOLWICH ARSENAL.

One of the great inventions of the nineteenth century is the steam-hammer. The idea first occurred to James Watt, and was patented by him in 1784; but the real inventor was James Nasmyth, a native of Edinburgh, and son of the Nasmyth who painted the well-known portrait of Burns. A drawing of the invention was made in 1839, and this was seen and patented by two French engineers, but it was not until 1843 that Nasmyth erected his first hammer at Patricroft, near Manchester. The invention was afterwards greatly developed and improved by Robert Wilson, who was manager to Nasmyth in the Bridgewater Foundry. The earliest hammers were only 5 cwt., but in recent years they have been made up to 125 tons. The hammer given in this illustration is 40 tons in weight, delivers a blow of about 1000 foot tons, and is chiefly employed in making large gun forgings. Each forging is taken from the neighbouring furnace, and is swung into position under the hammer (as here shown) by means of a large crane. The machine is under the complete control of the hammerman, who is stationed at the side upon a small platform.



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THE 40-TON STEAM-HAMMER AT WORK IN WOOLWICH ARSENAL.

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the seven years ending in 1884, about four millions of tons had been worked up into the hulls and machinery of mercantile vessels launched in British yards. Here again iron has been now, to a very large extent, replaced by steel. Many thousands of tons of iron are found in the telegraph-wires of land and sea, and the annual demand for this purpose, for the ropes of steel-wire that have been substituted for hemp, for fencing and other purposes, amounts to half a million tons of iron and steel. Another large use of the metal is seen in the so-called tin-plates for household uses and for packing preserved provisions. These plates are really made of iron coated with tin, and the British export of the material yearly exceeds 300,000 tons.

The iron industry affords employment to such vast numbers of miners, smelters, and craftsmen engaged in turning crude iron and steel into countless objects of utility to man, that it assumes a high national importance. We must pass into the workshops where, with infinite skill and ingenuity, the metal is manipulated into divers forms, before we can begin to realize the truth on this subject. Of such rough work as cast-metal pipes, a vast item in the trade, stove-grates, and kitchen-ranges, we take no account. The locomotive engine and its tender cost about £60 per ton, or nine times the value of the metal used in their construction. The spinning-mule of our factories, costing from £210 to £250, weighing six tons, and containing 1000 spindles, is sold for five times the cost of the materials. The steel-wire used for needles at Redditch, in Worcestershire, costs about £60 per ton when it is delivered at the needle-factory. The wire has been drawn out from ingots of Bessemer steel costing less than £5 per ton. The same material, made into common needles for export to China, is worth £260 per ton, and the best needles for home use are sold at £5600 per ton. At the same town, fish-hooks are largely manufactured. The wire used for the finest class of these goods costs £336 per ton, while the hooks themselves fetch, in the same weight, about £15,000. The height of contrast in value between raw material and finished work is reached in the steel hair-springs for watches and time-pieces. One ton of metal makes about 40 millions of watch-springs, worth in the retail about £400,000, or above thrice the value of pure gold. The main-springs of timekeepers are a coarse article, in comparison, fetching only about £6000 per ton.

During the Victorian age, a great change has occurred as to the localities furnishing iron-ore, and so becoming centres of the trade in pig-iron, steel, and the articles produced therefrom. We have seen that, during the eighteenth century, iron-making passed away from exhausted Sussex to the Midlands and the North, and, in some degree, to South Wales and to Scotland. In 1839, Great Britain was producing annually about one and a quarter millions of tons of pig-iron. Of this amount, nearly half a million tons came from Wales; about 365,000 tons from Staffordshire; 81,000 tons from Shropshire; 35,000 tons from Derbyshire; 52,000 tons from the West Riding of Yorkshire; 18,000 from Gloucestershire; 13,000 from Northumberland and Durham; and nearly 200,000 tons from Scotland. In the course of less than fifty years, we find that a revolution has taken place in some quarters of the land. In north-east Yorkshire, between Whitby and the river Tees, lies the wild, hilly, picturesque moorland district now known to all the world as Cleveland. That beautiful region is marked, on the North Sea coast, by fine bays and by wooded valleys, called "wykes", like the "combes" of North Devon; by bold cliffs of varied outline, culminating in the noble Bowlby Cliff, whose top lies nearly 700 feet above sea-level, second in height on all the coast of England and Wales; and by the matchless display in the public gardens at Saltburn-on-Sea, where a fine wyke is, on one side, left to its natural growth of gorse and heather, while the floor of the valley and the other face of the hill are decked, in summer, with beds of cultivated blooms of most brilliant hues. Inland, lie the varied charms of hill and dale, forest and fern, mountain-stream and waterfall, upland meadow, moorland and furze, heathery slopes and rocky banks, tangled coverts, and deep-drawn recesses and ravines—purples, and greys, and greenery of every hue. In this fair country, too little known, even in these days, to the tourist's foot, there lay below the soil, for ages unsuspected by the dwellers in the land, an untold wealth of iron-ore. In the eighteenth century, small pieces, gathered on the beach, were smelted near Chester-le-Street, in Durham. In 1836, a regular seam was found near Whitby, in the valley of the Esk, and the ore was conveyed by sea to the Tyne and the Tees, for smelting in the furnaces on the river-banks. In 1850, the make of pig-iron in this north-eastern district had risen from 13,000 tons to about 150,000. Then came the

discovery which, in a few years, wrought such a change in Cleveland, turning lonely hamlets into populous towns, and creating the largest iron-making district in the world. The bed of ironstone worked near Whitby was traced by Mr. John Vaughan to the vicinity of Middlesborough, and here, within easy distance of the Durham coal-pits, works for smelting speedily arose. The amount of pig-iron yearly produced in the district has now reached about three millions of tons.

Scarcely less startling has been the result of discovery and human labour in north-west Lancashire and in Cumberland. The produce of pig-iron in these districts has reached nearly two millions of tons, made from the red hæmatite ore, containing nearly 60 per cent of metal, found at Whitehaven, and at Ulverston, in the detached peninsular part of Lancashire lying between Cumberland and Morecambe Bay. The masses of this rich ironstone are found from 15 to 60 feet in thickness, and on a barren plain of sand has arisen the wealthy town of Barrow-in-Furness, where Bessemer "converters", at the chief iron-works, make weekly about 7000 tons of steel ingots. The discovery of iron-ore, during recent years, in Northamptonshire, Lincolnshire, and Notts has caused a yearly production of about half a million tons of pig-iron in those counties, where the output was *nil* in 1839. In the same period, the manufacture in Derbyshire has grown tenfold from the amount above given; and, in the West Riding of Yorkshire, more than six-fold. The product of South Wales and Monmouthshire has more than doubled, and now yearly exceeds a million of tons. The annual product of Wiltshire and Worcestershire has advanced from *nil* to 52,000 and 150,000 tons. The Staffordshire make of iron has grown from 365,000 tons to more than half a million. Turning now to Scotland, we find a vast development of the iron-trade in the Lowlands. In 1801, it is not likely that the Scottish production of pig-iron exceeded a weight of 10,000 tons. In the previous year the famous Black-band ironstone had been discovered near Glasgow, but even in 1828 the whole make of iron in the country did not exceed 30,000 tons. Neilson's discovery of the hot-air blast, above described, then made a speedy and wonderful change. A great saving of the coal employed for smelting was at once effected, and Scotland rose to the first rank as furnishing the cheapest pig-iron made in the world. The yearly product now

exceds a million tons. Her output of coal grew from about 7½ millions of tons in 1854 to nearly 29 millions in 1895.

The cotton-trade remains, in 1895, as it has long existed, by far the greatest of British textile industries. In 1801, it was probably the most backward of the larger manufactures, though, as we have seen, the inventions of Hargreaves, Arkwright, Crompton, Kay, Cartwright, and other ingenious men had paved the way for a vast future development. Successive improvements in the machinery used for spinning and weaving, and the cylinder-printing of calico, introduced about 1785 in place of the old block-printing, have been the chief agencies in giving this country the foremost position. The "self-acting mule" for spinning, invented in 1825 and improved in 1830, was a great step in advance. In 1841, a new power-loom reduced the weaver's labour by one-half, while it enabled him to turn out, in the same time, a greater quantity of better cloth. In 1801, the mule contained about 200 spindles in place of, as at present, 1000 to 1200, and the speed of the working, both for spindles and looms, has greatly increased in recent years. The calico sold at 6*s*. per yard near the close of the eighteenth century can now be had for less than as many pence. In spite of hostile foreign tariffs and the growth of foreign manufacture in cotton, the value of all kinds of cotton-products exported from Great Britain grew from 24½ millions in 1840 to 52 millions in 1860, and in 1887 had reached the enormous amount of 71 millions. In 1889 about 700,000 persons found direct employment in this great industry, upon the prosperity of which, in all its connections and ramifications in mill-erection, machine-making, buying and selling of the raw material and finished goods, nearly 5 millions of persons depend for their livelihood.

The woollen trade of Great Britain has also become of vast importance. Including worsted, a variety of woollen yarn or thread, spun from long-staple wool and twisted harder than usual in the spinning, for weaving into stockings, carpets, and other fabrics, this manufacture employed, in 1885, about 280,000 persons in the British Isles, and the value of our woollen exports rose from under 11 millions in 1854 to about 25 millions in 1895.

The first mill for spinning linen-yarn by machinery arose in 1787 at Darlington in Durham, and flax-spinning works were soon afterwards started in Scotland. In 1812 the weaving of linen by

power-looms was for the first time made a success, at a factory in London, and the manufacture by degrees assumed great importance. Its chief centres at the present day are Leeds in England, Belfast in Ireland, and Dundee and Dunfermline in Scotland. The Irish and Scottish make greatly exceeds the English production, the whole number of persons thus employed in 1885 amounting to about 112,000, of whom more than half were at work in Ireland, and nearly 40,000 in Scotland.

Passing over silk, a declining trade in this country, and hosiery, and lace, we turn to the manufacture of paper. A remarkable interest belongs to a material that has contributed more to the advancement of the human race than any other employed in the arts, and the use of which is so nearly dependent on the advance of civilization. The first paper-mill known in England was erected at Dartford, in North Kent, early in the reign of Elizabeth. The demand for paper in the present day is as inconceivable in amount as the variety of its uses is numberless, and the diversity of vegetable substances from which it can be made is wonderful. Vast progress has been made during the present century, with the united aid of chemistry and mechanics. It was in 1856 that the esparto grass of Spain was first employed in the British manufacture, and in 1890 the United Kingdom imported nearly 220,000 tons of that material. About 1880, wood-pulp was largely adopted, and in 1895 nearly 300,000 tons was used for the manufacture. The article in all forms has become phenomenally cheap, with a corresponding influence on the production of newspapers and books. The continuous rolls of paper, four or five miles long, made for the work of the newspaper rotary-press, are among recent marvellous results of mechanical skill. The production has grown from about 43,000 tons in 1842 to nearly ten times that amount in 1890, and the average price has sunk from £3 per cwt. in 1874 to 30*s*. The quality of British paper surpasses that of all other European fabrics in the same kind, and has secured an export-trade, to the value of above a million and a half sterling in 1889, for the markets of Asia, South America, and our own Colonies.

The growth of the British production of salt is a matter well worthy of note. Of all countries in the world, England produces and exports most of this indispensable condiment. Cheshire and Worcestershire are the chief centres of the trade, where the article

is manufactured both from rock-salt obtained by mining, and, to a far larger extent, from springs of brine due to the melting of rock-salt by water. The beds of rock-salt vary in thickness from about 50 to 500 feet, if we include discoveries at Fleetwood, in Lancashire (1889), and in Durham, between Middlesborough and Hartlepool, in 1862. In 1890, the rock-salt mined in England, chiefly in Cheshire, amounted to nearly 160,000 tons, and that obtained from brine to nearly two millions of tons, of which more than two-thirds were due to Cheshire. The commercial importance of salt largely depends on its use in the making of soda, soap, stoneware, and glass. The Cheshire production takes place in the valley of the river Weaver, with Northwich as a centre, in a district lying above a great basin of rock-salt twelve square miles in extent. The deposit was discovered in 1670, and lower layers in 1770, but the making of salt on a large scale began only in the nineteenth century. In 1825, the duty, which from 1805 till 1823 was 15*s.* per bushel, or 3*d.* per pound, was wholly repealed, and in 1892 the price of the article, which has greatly varied, was at 9*s.* per ton for common salt, while the far finer table salt fetched 13*s.*

In no branch of fabrication have British energy and skill made more striking advances than in the artistic work of pottery. The improvements made towards the close of the eighteenth century by the illustrious Wedgwood have been already noticed. The centre of production was by degrees established in the district of North Staffordshire known as "The Potteries", containing the now thriving towns of Stoke-on-Trent, Etruria, Hanley, Burslem, Tunstall, Longton, and Newcastle-under-Lyme. The fine ware called "soft porcelain", made in the eighteenth century at Bow and Chelsea, near London, and, as now, at Worcester and Derby, became well known at the close of that period, in Staffordshire, through the able efforts of Thomas Minton, the founder of the famous works called by his name. At the same time, Josiah Spode started the enterprise now in the hands of Copeland & Company. About 1850, Copeland and his rival, Minton, began the manufacture of Parian or statuary porcelain. In the latter half of the Victorian age our great name in the pottery-trade has been that of Sir Henry Doulton, born at Lambeth in 1820, and trained there at his father's works, where he laboured for many years at the potter's wheel. In 1846, at a factory erected near Lambeth Palace, the Doultons began the

fabrication of stoneware pipes for drainage, a trade which has since reached enormous dimensions. Two years later, the largest drain-pipe works in the world were started by the same firm near Dudley. Sir Henry, knighted in 1887, at the Queen's Jubilee, has won his chief fame by the revival of artistic pottery in faience, terra-cotta, impasto, silicon, stoneware, and other forms, in which his productions have gained the high approval of critics in every civilized country, and have won the highest awards at every notable exhibition at home and abroad.

We must now notice some industries whose origin, or, at any rate, commercial importance, belongs wholly to the nineteenth century. In 1836, a master wool-spinner of Bradford, in Yorkshire, named Titus Salt, was paying a business visit to Liverpool, when a broker showed him a bundle of stuff which had been sent on speculation from Peru, and had failed to find any purchaser. "What is it?" cried the ambitious young manufacturer, who was always on the look-out for new openings in business. "They call it alpaca," the merchant replied, "and it is the hair or wool of a kind of Peruvian sheep." Salt then pulled out a handful of the stuff, and saw a very long, fine, lustrous material of silken texture, almost metallic in appearance. In view of possibilities, he bought the bundle, and in his hands "alpaca" became known to the world. The animal which produced the new material for British spindles and looms is a ruminant mammal of the camel tribe, closely allied to the llama, in form and size resembling a sheep, but furnished with a longer neck, large beautiful eyes, and a shapely head. Its native ground and dwelling-place are on the lofty Andes of Chili and Peru, where it wanders in flocks of from one to two hundred, on the upland pastures near to the line of perpetual snow, driven by the owners, Peruvian Indians, to the huts only in shearing-time, when about seven inches length of wool is annually taken off. With the ingenious methods of treatment adopted by Mr. Salt, alpaca became a woven fabric of great beauty and strength, combined with other wools and with silk in the making of shawls, coat-linings, umbrellas, and fine cloth for wear in hot climates. Above two millions of pounds weight are now annually imported, and the alpaca-manufacture has been largely developed.

The dwellers in damp climates are greatly indebted to the waterproof substance called india-rubber, now employed for an

almost countless variety of useful articles. The raw material, known as caoutchouc, is an elastic gummy hydrocarbonic substance, contained in the milky juice of tropical trees growing in South and Central America, and in the East Indies. In its purest form, it comes from Para, the most northerly province of Brazil. It is a non-conductor of electricity, a bad conductor of heat, and not soluble in water either hot or cold. The dwellers on the banks of the great Brazilian river Amazon had long employed it for bottles, syringes, boots, and waterproofing when, about 1736, india-rubber was brought to Europe. This name was invented many years later on the discovery of its use for rubbing out the pencil-marks of black lead. About the end of the eighteenth century artists paid 3*s.* for a cubic half-inch of the material. Surgeons and chemists were already using it in the form of flexible tubes. In 1823, a great development of its utility came when an enterprising Glasgow chemist, whose name has survived in that of the article which he invented, patented a waterproofing process for dissolving the gum in alcohol and oil of turpentine, and in coal-tar naphtha. The coats called "Macintoshes" thus came into general use, and waterproofed rugs, and other forms of protection against wet, were largely made. About ten years later, an American citizen, Charles Goodyear, and an Englishman named Thomas Hancock, made independent discovery of the very valuable vulcanizing process, in which the caoutchouc is mixed with sulphur, and subjected to great heat, gradations of which, with variations in the quantity of sulphur employed, produce both a hard and horny, and a soft and elastic substance. This invention caused an enormous extension of the use of india-rubber. Thousands of patents have been taken out, and we see the result in overshoes, boots, shoes, gloves, belting for machinery, tubing of all sizes, life-preservers, gas-bags, buffers, wheel-tires, washers, valves, fire-hose, springs, tobacco-pouches, tapes or threads for weaving into elastic tissues, medical and surgical instruments, and many other forms. The hard vulcanite, or vulcanized caoutchouc, is easily cut, and takes a high polish, which makes it both useful and ornamental in the shape of combs, rulers, inkstands, penholders, buttons, canes, jewel-mounts, frames for artificial teeth, chains, bracelets, boxes, paper-knives, buttons, and other objects formerly constructed of horn or ivory or bone or jet. In larger forms, this admirable substance serves as furniture,

ornamental tiling, pavements, and as an excellent insulating cover for telegraph-wires. There are numerous works for the india-rubber manufacture throughout Great Britain, some of which employ more than 1000 hands. In 1889, our imports of the raw material amounted to 236,000 cwt., worth more than 2½ millions of pounds. A kindred substance to india-rubber is gutta-percha, the thick milky juice of trees that grow in Malacca, and in Borneo and other islands of the Indian Archipelago. Compared with caoutchouc, it is stronger, more soluble, and less elastic. Made flexible by heat, it is used as a substitute for leather in the soles of boots and shoes, as an insulating cover for the copper wires of submarine cables, for mastics and cements, bottles, and other purposes. It was introduced to this country in 1843 by Dr. Montgomerie of the Indian Medical Service, who noted its utility for making handles to surgical instruments. In 1895, about 48,000 cwt. were imported, at an average price of twelve pounds sterling. Among the articles made from gutta-percha we have also golf-balls, machine-belting, buckets, surgical splints, sheeting, whipcord, speaking-tubes, and water-pipes.

The last item in our category is the valuable textile fabric called jute. This fibre is the tenacious inner bark of a plant about twelve feet high, largely cultivated in Bengal and other hotter parts of India. There, from remote times, it has been woven into cloth for gunny-bags used in packing rice, sago, spices, and other native produce, as well as for clothing. The material's main merit is its cheapness both in raising and manufacture. Being liable to injury from water, it is not well adapted for cordage and canvas, and, in a textile form, the fibre is much inferior to flax both in durability and strength. It was at Dundee, in the reign of William the Fourth, that the jute-manufacture first became important in Great Britain, and that flourishing town is still the head-quarters of the industry. An enormous trade is there carried on in stout cloth for various purposes, sackings, tarpauling, carpets, and floorcloth lining. One branch of the Dundee export-trade consists in vast numbers of small, brightly-dyed prayer-carpets for the Mahommedan worshippers in the East. In 1885, more than 40,000 people, six-sevenths of them in Scotland, were employed in spinning and weaving jute, and the value of British exports amounted to about two millions sterling. In 1895 the raw jute imported into this country had reached nearly 400,000 tons.

CHAPTER VI.

NAVIGATION AND MERCANTILE SHIPPING.

Early timber-built shipping—Rivalry in the China tea-trade—The Aberdeen clippers—Use of iron and steel in ship-building—Improvement in sailing-ships—Introduction of steam navigation—William Symington and the *Charlotte Dundas*—Robert Fulton and James Watt—Early steamer-building on the Clyde—Ocean steam-ships—Improvement in building and engining vessels—The screw-propeller—The Cunard and other ocean steam-ship companies—"Atlantic greyhounds"—Description of the *Campania*—Shortening of ocean voyages—The luckless *Great Eastern*—Steam yachts—Tourist and river passenger steamers—The Allan and Anchor lines—Increase of British shipping—The compound engine and twin-screw—Work of Lloyd's Association—Admiralty charts—Benefits of the Merchant Shipping Acts—Beacons, lighthouses, and light-ships—Fog-signals—Eddystone and Bell Rock—Construction of breakwaters and docks—Deepening of rivers by dredging.

In no department of human progress have those mighty magicians, steam, coal, and iron, made a more wondrous change than in the conquest effected over natural forces on the pathless sea. In the nineteenth century we have, in this respect, far surpassed, for safety and speed, all that human ingenuity achieved from the dawn of civilization down to the close of the Napoleonic age. Wood-built craft, driven by oar and sail, were the only sea-going vessels known to the Phœnicians of old. Timber-built vessels, propelled by sail and oar, were the only sea-going craft in the days of Waterloo. The use of the compass by mariners is the only great exception to the rule that modern navigation, until the application of steam, differed only in degree, and not in kind, from that which was practised in the Mediterranean and adjacent seas before the opening of the Christian era. The form of ships, and the methods of employing sail-power, with the means of calculating the ship's place on the ocean, and the utility of maps and charts, were much improved in the course of time. Into this vast subject, however interesting and important, we cannot here for a moment enter. Let it suffice that, in 1801, the sailor, under certain conditions, was wholly helpless against wind and tide, and that navigation, in circumstances of the greatest urgency for carrying intelligence, or persons, or goods, was often either wholly prevented for a time or retarded with serious detriment to human interests. We shall first note the rise, during the Victorian age, of a superior class of sailing ships in the British Isles, the improvement being due partly

TEA-CLIPPERS RACING FROM CHINA FOR THE THAMES.

When the tea-trade with China began to flourish in 1842 with the opening of the treaty ports, the carrying-trade from the Chinese ports to London was all in the hands of American ship-owners. Then the British ship-builders bestirred themselves, but it was not until 1851 that a British-built ship won the race home. In that year the *Ganges* beat the two Baltimore clippers—*Flying Cloud* and *Bald Eagle*—by four days in the run from Whampoa to the Thames. The voyage, of course, was round the Cape of Good Hope, and occupied 108 days. From that time the home-built clippers began to outstrip the Americans in the China trade, and this was largely brought about by the substitution of iron for wood in the building of ships. From about the year 1856 the famous American clippers began to disappear, until in 1875 nearly the whole of the tea imported from China was carried in British vessels. The race home with the first consignment of the new season's tea used to be the occasion of much excitement, both because of the international rivalry and the commercial interests involved. In the illustration the two clippers are standing in for the North Foreland with every stitch of canvas set, the winner being still doubtful.



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TEA-CLIPPERS RACING FROM CHINA FOR THE THAMES.

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to novelty of lines in the hull, partly to the material used in the construction of hull and rigging. During the earlier part of the nineteenth century, the British ship-builders were far surpassed in scientific skill by those of Sweden, Denmark, France, and Spain, whose vessels were at once larger, swifter, and of better conduct in rough waters. The shipyards of the United States also turned out excellent craft. About 1834 the famous naval architect, John Scott Russell, born near Glasgow in 1808, established the principles on which speed in sailing depends, and his "wave-line" system of construction was by degrees adopted in this country. For some years after the opening of the China tea-trade in 1842, the sailing-ships of Baltimore and Boston, in the States, enjoyed almost a monopoly in the markets through their quick delivery of cargoes of new tea. Then the British builder was aroused, and in 1846 Messrs Hall of Aberdeen launched a large schooner on the plan of the Baltimore clippers which, in that size, were sharp in the bow, deep in the stern, of great length, lying low in the water, with long, slender masts and large sails cut with great skill. The *Torrington*, as the new vessel was called, proved a great success in the China coasting-trade, and the Aberdeen yard quickly turned out ships of the same class but of greater burden, for the tea-trade to European ports. For ten years more, however, the American vessels had the better of the contest, though, in a famous race run in 1851 from Whampoa, near Canton, to the Thames, the English ship *Ganges* beat the two Baltimore clippers *Flying Cloud* and *Bald Eagle*, the one by four days, the other by four and a half. The last part of the contest, up the English Channel, was very exciting, as all three ships were close together off Portland, the Americans having started three days before the *Ganges*. It is curious, in these days, to note that the winner, coming round the Cape of Good Hope, occupied 108 days in her passage. About this time, the great mercantile house in the China trade, Jardine, Matheson & Co., caused a splendid vessel, on the finest lines, and of stouter timbers than the American, to be built for their service. This craft, called the *Stornoway*, was the first of the renowned Aberdeen clippers of the larger type, but the Baltimore ships were still about double the tonnage of the British, and for some years yet we remained in the rear. In April 1853, the *Joseph Fletcher*, a British clipper, arrived in the Thames, 104 days from Shanghai, the swiftest passage then

made by any of our tea-ships. In other directions, fine British vessels, Black Ball liners and others, were making the voyages to Australia and New Zealand in about 90 days.

In 1856, our ascendency over the Americans in the China trade began to be established. The day of iron ships, apart from steamers, had arrived, a change largely owing to the able advocacy of the famous Scottish engineer, Sir William Fairbairn. A vessel made of iron plates is lighter than a wooden ship of the same size, and the metal is more easily dealt with than timber, since it can be bent, in a heated state, into any required shape. We may finish this subject of material for ship-building by noting that, within the last few years, the use of steel plates has almost entirely replaced that of iron for marine purposes. A further gain in lightness, with equal strength and ease of management, is thus secured. As compared with wood, a steel vessel can carry 2200 tons of dead weight against 1870 tons for a wooden ship, and the thin sides of the steel ship would give, in craft of that tonnage, 4000 more cubic feet of internal space. Returning to the British and American contest for supremacy on the sea in the carrying-trade, and its final issue, we observe that in the year 1856 the *Lord of the Isles*, one of our earliest iron-built vessels, racing home from Foochow, the Chinese port, against two of the most famous Baltimore clippers then afloat, beat them both by some days. From that time the noble American vessels began to disappear. British wealth in iron and skill in its working gave an irresistible superiority to the shipyards of the Clyde, the Tyne, the Wear, and other localities, and by 1875 nearly the whole of the tea imported into the United States was carried in British vessels. Then our builders keenly competed with each other, and sailing-ships were launched of such beauty and speed as the world had never seen. Steele of Greenock and Hood of Aberdeen were among the most renowned of these constructors, and it was the Greenock builder that in 1865 sent forth the *Sir Lancelot*, first and foremost of the whole fleet of tea-ships. This wonderful vessel, in 1869, did the voyage from Foochow to the West India Docks in London, nearly 15,000 miles, in 89 days. The increase of speed in sailing-ships is further illustrated by the fact that another British clipper, the *Thermopylae*, built at Aberdeen, made the passage from the Thames to Melbourne in 1869 within 60 days, or 30 days less than

had been considered a fair run for a liner twenty years previously. A few years more passed away, and, in the swift advance of improvement, these noble vessels of the oriental trade, the China clippers, vanished one by one in the presence of steam.

It must not be supposed that the day of sailing-vessels, as cargo-carriers, is yet finished in our mercantile marine. Wind is a cheaper propeller than coal, and where extreme quickness of despatch is not required, steel sailing-ships, with wire rigging and a great capacity for carrying goods, may long hold their own against steam. Since 1870 there has been a great revival of ship-construction in this class of craft. In that year there were not more than ten British sailing-ships afloat of two thousand tons register and upwards. In 1893 there were more than ten fine steel-built sailers, each above three thousand register tonnage. In 1892, one shipyard on the Clyde, that of Messrs. Russell & Co., launched twenty-six steel sailing-ships, with an average register of over 2000 tons. Of this fine fleet, thirteen varied in tonnage from 2300 to 3500, and the smallest of all was rated at 1400 tons. Other builders on the Clyde constructed, in the same year, more than 40 vessels of the same class, averaging far more than 2000 tonnage registered. At Leith, one of 3200 tons was sent afloat, and on the Tay, two more of nearly 3000. The largest sailing-ship afloat in 1893 was owned in France, but she was built on the Clyde in 1890. This five-master ship, called *La France*, has carried 6000 tons of nitrate of soda from Iquique, the Chilian port, to Dunkirk.

The use of steam for navigation began, in a feeble and tentative fashion, near the close of the eighteenth century. In 1783, a paddle-steamer, of French construction, was tried with some success at Lyons. In 1790, an American paddle-boat made 7 miles an hour with steam, and carried passengers on the river Delaware. In Great Britain, the first practical steamboats are traced to the ingenious Scottish mechanic, William Symington, who drove a small steamer, in 1788, with two paddle-wheels, at 5 miles an hour, on Dalswinton Loch, Dumfriesshire. In the following year he aided in the construction of a larger paddle-boat that made 7 miles an hour on the Forth and Clyde Canal. No continued use followed these successes, and it was not till 1802 that the same canal bore upon its waters the first practically successful steam-boat that was ever built. The construction of this vessel, the *Charlotte Dunda*

was due to the capital of Lord Dundas of Kerse and to the mechanical ability of Symington. She had one paddle-wheel near the stern, and this was driven by a direct-acting horizontal engine, with a connecting-rod and crank, a most important advance on previous attempts, where the action had been applied to the wheels by intermediate levers and other arrangements. Again, however, commercial adoption and continuous employment failed to attend the work of Symington. The *Charlotte Dundas* had proved her value by towing two laden barges, each of 70 tons burden, for 20 miles in 6 hours, but the canal-proprietors declined to take up the matter, on the ground of injury to the canal-banks from the wash caused by the wheel. The boat was beached, and at last broken up. After this, steam-navigation was taken up in America by Robert Fulton, and in Scotland by Henry Bell, a native of Torphichen Mill, Linlithgowshire, who was first a millwright, then an engineer under the Rennies, and afterwards settled at Glasgow and Helensburgh. During his residence at the latter place, from 1807 onwards, Bell was devoted to mechanical experiments connected with steam-navigation. In June, 1812, a vessel on his design and at his cost was launched from the yard of John Wood, of Port-Glasgow, fitted with an engine by John Robertson of Glasgow. This famous craft, named the *Comet*, from a brilliant heavenly body which had lately appeared, was driven by paddles at 6 miles an hour, and ran on the Clyde from Glasgow to Helensburgh and thence to Greenock, until she was wrecked in 1820. The memory of Bell, who died in 1830, is celebrated by a monument erected at Dunglass Point, on the Clyde. The *Comet* was quickly followed by a whole fleet of steamers, the shipwrights and engineers of the Clyde maintaining then, as now, the leading place in their construction. Wood of Port-Glasgow, Denny of Dumbarton, M'Lauchlan of the same port, and Scott of Greenock, were conspicuous among these early builders, and great advance was due to the energy and skill of David Napier, the marine engineer, of Glasgow. In 1816, steamers were running on the Thames between London and Margate, and in 1819 Napier despatched the *Robert Bruce*, of 150 tons and 60 horse-power, first of a line of steamers plying between Glasgow and Liverpool. Mr. James Cook, of Tradeston, Glasgow, was another eminent maker of engines in these early days of marine steam-traffic, and introduced many improvements in their construction.

Turning to the subject of ocean steam-ships, we find that the credit of first crossing the Atlantic is usually given to the American paddle-steamer *Savannah*, when she made the voyage from that port to Liverpool in 1819. This statement is, to some extent, misleading. The *Savannah*, a vessel 100 feet long and of about 300 tons burden, was not a steam-ship in the true sense, but a full-rigged packet-ship, with a small steam-engine on deck, moving a pair of paddle-wheels in smooth water. During her voyage of twenty-five days, she was under all sail for at least two-thirds of the time. The first steam-vessel, properly so called, that ever crossed the Atlantic, was the *Royal William*, launched at Quebec in May, 1831, and built by a Scot, James Goudie, who had served his time and learnt his business at Greenock. Propelled wholly by steam, this vessel traded for some time between Quebec and Halifax, in Nova Scotia, where she was seen by a Mr. Cunard, who made many notes concerning the craft, and brooded to some purpose over the answers to his questions. The *Royal William*, of 1370 tons in builder's measurement, 146 feet in length on the keel, and with 29 feet 4 in. beam inside the paddle-boxes, left Quebec on August 4th, 1833, and, steaming all the way across, arrived in London in 25 days. She afterwards passed into the Spanish service as a man-of-war. The Atlantic steam-ferry was fairly started in April, 1838, by the voyages of the *Great Western* and the *Sirius*. The *Great Western*, 212 feet long, with 35 feet 4 in. beam, 23 feet depth of hold, and 1340 tons burden per register, was built from the plans of Mr. Isambard K. Brunel, engineer of the Great Western Railway, and designer of the famous *Great Britain* and *Great Eastern* steam-ships. Her engines were due to Messrs. Maudslay, Sons, & Field of London, and were of 440 horse-power. On April 8th she started from Bristol, and in 14 days received a grand reception from enthusiastic crowds at New York. At the same time, the *Sirius*, a vessel of but 700 tons and 320 horse-power, came in from Cork, but she had started 4 days before her competitor.

The problem was now solved, and transatlantic steam-traffic was soon inaugurated on a great and permanent scale. In 1839 the Cunard Company was started by Mr. Samuel Cunard, a native of Halifax, Nova Scotia, and his partners, Mr. George Burns of Glasgow, and Mr. David M'Iver of Liverpool. An annual sub-

sidy of £55,000 had been secured from the government for the carriage of mails, and the steam-service between Liverpool, Halifax, and Boston began its work in July, 1840. The pioneer vessel was the *Britannia* of nearly 1200 tons, and 740 horse-power, the engines being made by Robert Napier of Glasgow. The outward voyage to Halifax occupied about 12½ days, and the homeward only 10. Her sister-ships of this first fleet were the *Acadia*, *Columbia*, and *Caledonia*, vessels of similar size and power. Year by year steam-ships of greater size and horse-power were launched, and, on the Atlantic service, by 1848, the average speed had been raised from 8½ to 10¼ knots per hour.

Steam-service between this country and the East had begun in 1825, when a small ship called the *Enterprise*, of about 500 tons and 120 horse-power, went from London to Calcutta in 113 days, being the first steamer that ever doubled the Cape of Good Hope. It was long, however, before any regular steam-communication with the East Indies was established. In 1836 a syndicate of London merchants issued a prospectus on the subject, in which they expressed a belief that India, round the Cape, and Australia, might be reached, at the outset, in 73 days, with a probable reduction to 60 or even 50 days. The East India Company, however, put a stop to the plans of the projected "New Bengal Steam Company", and took the matter in hand themselves. The merchants of London and the East clamoured for an efficient packet-service between London and Alexandria, with a continuation, after the break in Egypt, from Suez to Bombay. In December, 1836, the steamship *Atalanta*, of 630 tons, and 210 horse-power, built at Blackwall, on the Thames, by Wigram & Green, was despatched from Falmouth to ply on the Indian side of the route. In 1837, her sister-ship, the *Bernice*, under steam alone, made her way from Falmouth to Bombay in 88 days. The still great and flourishing Peninsular and Oriental Company, the popular P. and O., began in 1837 as the "Peninsular Company", carrying the mails to Portugal and southern Spain, and afterwards to Egypt. In 1840 the association, in its existing form, was incorporated by royal charter, and a fine fleet of steamers was gradually formed. The progress of economy in steam-traffic cannot be better illustrated than by the facts that the first P. and O. steamship, the *Iberia*, was able to propel a displacement of only 17 tons, at 8 knots per hour,

for each ton of coal consumed, and that in 1893 many of the Company's ships were able to propel 100 tons of displacement, for each ton of coal, at 16 knots an hour. The chief causes of this marvellous change will be shortly disclosed. In 1847, the Pacific Company was established, and other lines, as time passed on, carried passengers and goods swiftly, and with a high degree of safety, to all the chief ports of the civilized world.

The increase of size and shape, mainly as to length compared with breadth, in the hulls of steam-ships; the greater power of engines; the change of material for the body of vessels, and of the mode of propulsion, have been the most important elements in the development of higher speed. Ingenious improvements in engines and boilers have attained far higher pressures of steam, with safety and economy in their production and use. It was in 1832 that the first steamers built of iron appeared both on the Tyne and the Clyde. For many years this material met with strong opposition, arising from distrust as to its safety for the purpose. Turning for a moment to the method of propulsion, we find that the screw was used with success on the Thames in 1836, and, in a vessel called the *Archimedes*, in 1839, with a still more favourable result. The *Great Britain*, completed by Brunel in 1843 for the Atlantic service, combined both novelties. She was constructed of iron, and she was propelled by a screw. The propeller was a marked success, though here again many years were to elapse before its general adoption. On her fourth voyage from Liverpool to New York, the *Great Britain* was stranded in Dundrum Bay, on the north-east coast of Ireland, and there she lay aground for nearly a year, in an awkward position, and was afterwards floated without having suffered any serious damage. The career of this fine steamship had suffered a check, but that very mishap had settled the dispute between wood and iron. No more doubts as to stability and strength in iron as material for ships' hulls haunted the minds of builders and owners. The *Great Britain*, which won afterwards a noble record in the Australian trade, was a marked advance upon previous vessels in size, measuring 320 feet in length, with 51 feet beam, and 32½ depth of hull. The screw-propeller became the favourite at last, for ocean-service, from its obvious advantage in position, so that it continues acting both under a rolling and a pitching motion of the ship, and from its great superiority of

power in dealing with a larger body of water in a given time, contrasted with the paddle-wheel. In 1855, the Cunard Company sent to sea their first iron vessel, the *Persia*. In 1861, the *Scotia*, a "Cunarder", proved to be the last paddle-wheel steamer, for Atlantic service, built for her Company. Henceforth the Cunard fleet was reinforced by ships of iron, or later, of steel, and all these were driven by the screw-propeller. The *Scotia*, in her day, was justly regarded as the model of an ocean steam-ship. She measured 366 feet in length, 47½ feet in beam, and 30½ in depth, dimensions in which we note the increase of length as compared with breadth. The *Great Britain's* length was little more than 6¼ times her breadth; the *Scotia's* breadth was little more than ⅛ of her length. Her engines, by Napier, were of 475 nominal horse-power, but, at top speed, they worked at nearly nine times that value. The *Scotia's* speed exceeded that of any ocean-steamer then afloat, and in 1866 she completed the Atlantic voyage, Queenstown to New York, in just under 8 days 3 hours. Year by year, the vessels grew larger, and on lines that gave a length ten times the breadth, or varying from that to ninefold. The time between Queenstown and New York was brought down in 1877, by the *Britannic*, to under 7 days 11 hours. This splendid vessel, of the White Star Line, is a sister-ship of the *Germanic*, both from the yard of Messrs. Harland & Wolff, of Belfast. The *Britannic* is 455 feet long by 46 broad. Her tonnage exceeded 5000, and her indicated horse-power of engines was 5500. A fierce competition for speed across the Atlantic raged between the various rival Companies. In 1882, the *Alaska*, of the Guion Line, built on the Clyde by the Fairfield Company, did the Atlantic passage in less than 6 days 19 hours. She was 500 feet long by 50 broad, and her engines worked up to 10,500 horse-power. The *Servia*, of the Cunard Line, measured 515 feet by 52, was of 7400 tons, and engine-power rivalling that of the *Alaska*. A few years pass away, and the *Etruria*, a Cunarder, from the Fairfield yard, and her sister-ship, the *Umbria*, have engines working up to above 14,000 horse-power, and the latter vessel, in 1887, has brought the voyage down to under 6 days 5 hours. The average-passages exceeded the above records by some hours. Larger and more powerful the Atlantic liners grew, until in 1891 the *Majestic* and *Teutonic*, launched at Belfast by Harland & Wolff, crossed the Atlantic in

5 days 18 hours and 5 days 16½ hours. Their length just exceeded 580 feet; their tonnage was nearly 10,000, and the horse-power of the engines was 18,000. The Cunard Company, resolved not to be beaten by any rivals, American or British, then gave instructions to the Fairfield Shipbuilding and Engineering Company, on the left bank of the Clyde below Glasgow, which resulted in the production of those magnificent and for some years unrivalled specimens of commercial marine architecture, the *Campania* and *Lucania*. These fleetest of all the "Atlantic greyhounds", these wonders of human achievement, ready for launching within a year of the time when the keels were laid, have each crossed the Atlantic (Queenstown to New York, or *vice versa*) in about 5 days 13½ hours. These superb vessels represent the highest development of marine architecture and engineering skill down to the date of their existence, and may be regarded, when we consider their marvellous adaptations of means to ends, as among the most distinctive products of the Victorian age, most characteristic of the time and race that display their wonders to the world. Strength and speed are combined in a rare union which enables them, under contract with the Admiralty, to become cruisers armed with long-range cannon that would make them formidable to most men-of-war. For safety either from the violence of waves and winds, or of hostile shot and shell, they are fitted with steering-gear in triple independent form. Their coal-capacity is so great that, on cruising-service, they could for some time burn five hundred tons a day. These luxurious floating hotels have dining-rooms fit for royal banquets, and drawing-rooms, private sitting-rooms, and boudoirs which furnish the comforts and splendours of home to the richest and most exacting ladies of the time. In viewing the *Campania*, the first launched of these sister-ships, we see lines and proportions of such beauty that her colossal size fails at first to fill the mind of the spectator. The fact is only realized when an ordinary "liner", say of 5000 tons burden, lies alongside. She is as charming a specimen of marine architecture as any of the old sailing clippers, and she is also 620 feet in length, 65 feet 3 inches in breadth, 43 feet in depth from the upper deck, with a tonnage of 13,000, and engines working up to 30,000 horse-power. The engine-room, with its two sets of the most powerful triple-expansion engines ever constructed, is a maze of pipes, rods, cranks, levers, wheels, and

cylinders to the unskilled eye, presenting perfect order to that which has been trained in the mechanical arts concerned with the marvellous results which British ingenuity has attained after fifty years of ceaseless study, experiment, and toil. In addition to the main engines, there are many others for producing the electric-light that blazes at night throughout the vessel, and ahead over the sea; for driving the pumps of the water-condensers; for the steam-cranes; for the refrigerating-chambers carrying meat and other produce; and for numerous other needs of comfort and security to all on board. Ninety-six furnaces heat 12 huge boilers, composed of about 800 tons of steel, in plates 1½ inch thick, and each weighing 4 tons. The rudder is a mass of steel-plating that weighs 24 tons. This moving town is fitted to carry 460 first-class passengers, 280 second-class, and 700 in steerage, with a crew of 400 engineers, firemen, sailors, and attendants, or 1840 persons in all. The dining-room, 100 feet long and 64 broad, is furnished in dark old mahogany, and seats 430 persons. A new feature in this magnificent apartment is a dome rising to a height of 33 feet from the floor to the upper deck, and lighting both the dining-saloon and the drawing-room on the deck above. The grand staircase to these rooms is of teakwood; the drawing-room is in satin-wood relieved with cedar and painted panels. The smoking-room on the promenade-deck reproduces an old baronial hall of the Elizabethan age, with oaken furniture and carvings. The other public rooms, including a library and ladies' boudoir, are fitted with a quiet taste and artistic effect in strong contrast with the vulgar, gaudy, gilded gorgeousness prevalent on some lines of ocean-steamers. The state-rooms for first-class passengers, on the main, upper, and promenade decks are like real bed-rooms, instead of being the cramped cabins, with narrow "berths", formerly supplied at sea. Besides the single bed-rooms, there are suites of apartments for families or parties, fitted with ornamental woods, rich carpets, and brass bedsteads in place of the old wooden "bunks". Light, height, and good ventilation are found in all the sleeping-chambers. The second-class passengers, in the after-part of the ship, have spacious, beautiful state-rooms, a handsome dining-saloon in oak, a drawing-room in satin-wood, and a comfortable smoking-room, all on a par with the usual first-class accommodation. As for speed, about twenty-five miles an hour is the average throughout the voyage.

On the subject of communication by sea, we may note the change, during the nineteenth century, from the old six-months' voyage to India round the Cape, first to the forty and then to the thirty days' transit by the Overland Route through Egypt, and, by degrees, to the acceleration due to the railway extension to Brindisi, on the Adriatic, and to unbroken steam-ship passage, through the Suez Canal, to the Indian ports, enabling travellers and the mails to reach London from Bombay within the space of 14 days. Since the earlier decades of Victoria's reign, the passage between the British Isles and our Australasian colonies has been shortened, first from the 90 days of the sailing-clippers to the 53 days of the *Great Britain*, which was considered a marvel, and now to the voyage of from 30 to 35 days *via* the Suez Canal. A notable feat of steam navigation was performed at the end of 1892, when the twin-screw *Ophir*, of the splendid Orient Line, left Albany, in West Australia, on St. George's Sound, on November 5th, and arrived at Plymouth, on December 3rd, in 28 days 10 hours from land to land, inclusive of all stoppages.

Before passing to some notice of another class of steam-vessels, we may refer to that portentous failure, save for one important purpose, of Brunel's and Scott Russell's engineering audacity and enterprise, the luckless *Great Eastern*. Her designers planned and constructed this hugest piece of marine-building on record at the instance, in 1852, of the Eastern Steam Navigation Company, who desired to possess a vessel, for trading between Great Britain and India round the Cape of Good Hope, which should be capacious enough to carry coal for the outward and homeward voyages, and have space for a large number of passengers and a great quantity of cargo. It was believed that a vast increase of size would be attended by a like advance of speed, and the miscalculation made on this point alone reflects great discredit on all concerned. From 1854 to 1858 the vessel was under construction at Millwall, on the Thames. Misfortune dogged her at every step. Delays in the work were caused by repeated financial difficulties. An air of ridicule was attached to the change of her name. The promoters had dubbed their vessel the *Leviathan*, but an outcry arose from the Puritanical part of society that this was an impious use of a word that occurs in the Old Testament scriptures, and the directors curried favour with the sanctimonious by

abandoning the proposed designation. In November, 1857, the hull was ready for launching, but the vast weight of metal declined to move from the stocks, and it was not till the end of January, 1858, after several failures, efforts continued through many weeks, and an additional expenditure of £60,000, that the ship, in her bare form, was afloat on the waters of the Thames. During 1858, and some months of 1859, the internal fittings proceeded as fast as money could be procured. The Eastern Steam Company had to go into liquidation, and then a "Great Ship Company" of credulous investors bought the vessel and found capital to complete their bargain. On September 8th, 1859, the *Great Eastern* left the Thames on her trial trip. She was passing Hastings when a tremendous explosion of a "jacket", or casing to heat the water before it entered the boilers, blew up the centre of the vessel, and tore away one of the five enormous funnels, each weighing 8 tons, with much of the decks and cabins and steam-gearing. Seven persons were killed and others wounded, and the voyage came to an abrupt end off Portland. In January, 1860, as the great ship lay in Southampton Water, her commander, Captain Harrison, perished from the capsizing of a small boat in a sudden squall. At last, in June, 1860, she left Southampton for a run across the Atlantic. She was 680 feet in length, 83 feet broad, and 60 feet deep, with six masts, of which five were made of iron. The peculiarity of her propelling power was that the engines, eight in number, drove two paddles as well as a screw. The engines worked up to about 9000 horse-power, and enabled her to attain the good average speed, in those days, of 14 knots, or nearly 16 miles, an hour. A bad investment for the usual passengers and cargo, from the length of time needed to obtain a paying amount of human and commercial freight for each trip, the *Great Eastern* was employed on one or two occasions for the conveyance of troops. In one of these voyages, with over 3000 soldiers on board, as she ran from the Mersey to Canada, she was caught in a storm about 300 miles to the west of Cape Clear, and so far disabled as to be compelled to put back to Kinsale, in county Cork. The travelling and trading public would, by this time, have nothing to do with the unwieldy mistake, in a commercial sense, of Scott Russell and Brunel, which had cost, from first to last, before her disastrous trial trip, about three-quarters of a million sterling. At last the

Great Eastern, in 1865, found her only proper work. She was safe against sinking in any weather; she was very steady in an ordinary sea-way; and she had unrivalled capacity for stowage. Fitted with tanks for the coiling of a huge mass of submarine wires, and with machinery for paying out the telegraphic rope, she was successfully employed in laying the earlier Atlantic cables, and, after 1869, in the same work on Atlantic waters, in the Red Sea, and in the Mediterranean. When the bulk of this work was finished, and after further failure in attempts to obtain passengers and cargo, the vessel became, in 1884, a coal-hulk at Gibraltar, and was then sold in London, by auction, for about a thirtieth of her original cost. She then made some money for her new owners as a "show" ship, and in November, 1888, sold by auction at Liverpool in lots for which the bidding extended over five days, she fetched nearly £60,000 to be broken up as old metal.

Another class of vessels driven by steam has become of great importance in this age of pleasure-seekers by water and land. Apart from the tiny, graceful, bustling steam-launches which, when the weather favours them on our coasts, flit from port to port, or, in the upper reaches of beautiful rivers, the Tamar, the Dart, and the Fal in the west, the Thames, the Orwell, the Tyne, the Tees, the Forth and many other waters on the east, speed from scene to scene under summer skies, we have a large fleet of steam-yachts owned by the wealthy and luxurious part of the population. In 1850, there were but four or five such vessels afloat under the British flag. In 1892, there were about 150 steam-yachts on Lloyd's Register above 300 tons, of which 55 exceeded 500 tons' burden, and a dozen were more than 1000 tons. Some of these larger vessels visit all parts of the world, like Lord Brassey's famous *Sunbeam*, and are to be met with off the coast of Spitzbergen far within the Arctic Circle, and amid the tropical scenery of West Indian and Pacific isles. The historic and picturesque Mediterranean, the noble scenery of the Hebrides, and the still grander natural features of Norwegian fiords, attract the owners of many of these swift and graceful craft, in no fear of lying helpless in a calm, and able to encounter hard usage from wind and wave. Only very wealthy persons can afford to maintain these luxurious and expensive movable abodes, but tourists of moderate means are now enabled to visit Norway, the Mediterranean, Madeira, the Canaries, and the West Indies, not

merely in the usual passenger-boats, but with parties of a fixed number conveyed in well-appointed steamers of from 1500 to 3000 tonnage, specially fitted for such a service. On the estuaries of the Thames and the Clyde are now to be seen, throughout a long summer season, crowds of happy tourists on the upper and lower decks of swift and graceful saloon-steamers, powerfully engined, and furnished with all that can be needed for bodily comfort and refreshment during a day of pleasure amid the purest air, and, on the Clyde and the adjacent seas, in presence of some of the fairest of European scenery. Here, as in nearly all else that concerns steam-shipping, the Scottish river has an undisputed pre-eminence. The *Lord of the Isles*, the *London Belle*, the *Kohinoor*, and other fine vessels that ply between London Bridge and Sheerness, Southend, Clacton, and Harwich, were all constructed and fitted on the Clyde. At Glasgow, the tourist can step on board those noble vessels of David MacBrayne's, the *Iona* and the *Columba*. Inferior in size to the towering three-storey vessels of American waters, the *Columba*, a model of elegance, comfort, safety, and swiftness, is the finest specimen of river-steamers to be found in Europe. Steady as a rock, she races easily along, with very little shaking, at her highest speed of nearly 20 miles an hour. There is a grand upper promenade-deck, and a great length of cabin aft, divided into dining-saloon below and a luxurious drawing-room above, with plate-glass sides in all the length, affording a perfect view of the scenes that are passed on either hand. The vessel, built of steel and engined by Messrs. Thomson of Clydebank, measures 316 feet in length, and is supplied with an admirable table, a travelling post-office, bookstall, fruit-stall, and every need for her daily return-trip between Glasgow and Ardrishaig, at the Loch Fyne end of the Crinan Canal. All tourists to the west of Scotland are acquainted with the merits of MacBrayne's fine fleet of red-funnelled steamers, and whoever, for example, has made the trip from Oban, on board the *Grenadier*, to Staffa and Iona, with the complete circuit of the great island of Mull, on a fine day of summer, has enjoyed an experience not to be forgotten.

Among the Companies that own fleets of great ocean-steamers, in addition to the Peninsular and Oriental, the Orient, the Pacific, the Cunard, the New Zealand, and the White Star Line, with its huge Belfast-built vessels, we must notice the Allan Line, founded

by Alexander Allan, who owned and commanded a ship that carried stores to the Peninsula during Wellington's great struggle. After 1814, he traded regularly between the Clyde and Canada, and in 1820 the Allan Line of sailing-ships was established, forming a chain of communication between the Scottish river and the St. Lawrence that has continued unbroken to the present day. In 1853 the first steamer of this line was built at Dumbarton by Messrs. Denny. The *Canadian* was a paddle-wheeler of 277 feet in length, with a breadth of 33, and a burden of 1765 tons. In the same year the Canadian mail-service was begun, with Liverpool as the port of starting, and in 1862 the Allan steam-service arose between Glasgow, Quebec, and Montreal. In 1871, the Company ran ships between Liverpool and St. John's (Newfoundland), Halifax (Nova Scotia), and Baltimore, and a later development took their steamers from Glasgow to Boston, Philadelphia, Monte Video, and Buenos Ayres, and from London to Quebec and Montreal. In 1887 the fleet consisted of 12 iron sailing-ships of over 18,000 tons in all, and of 31 steamships (24 of iron and 7 of steel), with a total burden of 96,000 tons. The Anchor Line was started in 1856 by Messrs. Handyside & Henderson of Glasgow, the Mediterranean being their first scene of enterprise. In 1863, their Glasgow and New York service began with the *Caledonia* and *Britannia*, and the motto on their flag, "Secure amid perils", has been well illustrated by safe and efficient service. In 1887, their fleet comprised 43 vessels, with a total of 117,000 tons. The *Furnessia*, at that date their largest vessel leaving the Clyde, is 445 feet by 44 in length and breadth, and has a tonnage of 5500.

A few figures may here be given in proof of the enormous growth of British shipping during the reign of Victoria. In 1836, there were 25,820 vessels on the register of British ships, with a tonnage of about 2,792,000. Of these vessels, 600 were steamers, of about 68,000 tonnage in all. In 1886 the register showed about 38,300 British vessels, with a tonnage of 9,323,000. The number, it will be seen, was only about 48 per cent larger, but the tonnage had increased far more than threefold. This, however, gives no just idea of the real advance that has been made. In 1886, 8910 ships on the register were steamers, of 4,293,000 tons. It is fairly estimated that one ton of steam-shipping, from superiority of speed, does four times the work of one ton of sailing, so

that, whereas in 1836, taking the work done by a sailing ton as the unit, there were nearly three million effective tons of shipping, there were, on the same basis of calculation, in 1886, more than twenty-two millions of effective tons, or above seven times the amount of fifty years before. The ship-building figures from Lloyd's Registers of September 1875 and 1891, are very striking as regards changes from sail to steam in propelling force, and, in material, from wood to iron, and thence to steel. On September 30th, 1875, there were building, in the yards of the British Isles, 157,000 tons of iron steamers, 106,000 tons of iron sailing-ships, 1000 tons of wooden steamers, and 51,000 tons of wooden sailing-vessels. On the corresponding day, 16 years later, in 1891, there were on the stocks in our ship-yards 516,000 tons of steamers, of which 503,000 were of steel, and the rest of iron, and 186,000 tons of sailing-ships, of which but 3500 were of wood, 2500 of iron, and 180,000 of steel.

The chief improvements in marine engines which are connected with the increased speed, power, safety, and economy of steam navigation have been the invention and adoption of the compound principle in working, of surface-condensing, and of twin-screws. It was the firm of Messrs. Randolph & Elder, on the Clyde, that successfully introduced the compound engine in 1854, with two cylinders of unequal size. The smaller or high-pressure cylinder first received the steam from the boiler, and cut it off when about half the stroke of the piston was done. The steam thence passed into the larger or low-pressure cylinder, having from three to four times the capacity of the former. There the reduced pressure, acting on the larger area, was capable of as much work as in the smaller cylinder, and the result was that, with a simpler mechanism than for the same degree of expansion of steam in two independent cylinders, the loss by condensation in the cylinders was much reduced, and at least an equal, and a more equable and uniform, driving-power was obtained. This double-expansion system was soon found to save from 30 to 40 per cent of fuel, since the steam produced in the boilers was more fully utilized, and less production of the moving agent was required. In the surface-condenser, the steam, after being used, is reduced to water by contact with the outer surface of a great number of small tubes, through which a current of cold sea-water is kept always flowing. This water, after

doing its service, is returned to the sea, while the water into which the waste steam has been condensed passes to the hot well, and the boiler is kept fed with distilled water, and so preserved from incrustation with matter which cannot be vaporised, and which previously caused the need of a wasteful process called "blowing-off". The firm of R. Napier & Sons is credited with the triple-expansion engine, in which the use of three cylinders instead of two has ultimately reduced the consumption of coal from 4 to 4½ lbs. per indicated horse-power per hour, before the days of compound engines, to less than 2 lbs. for the same amount of work. Quadruple-expansion engines, with four cylinders, have also been constructed, but have not yet been employed to any large extent. Since 1889, the use of twin-screws, for ocean-steamers of the largest and most powerful class, has been adopted with marked advantage. With the almost entire disuse of sail-power in this class of vessels, it has become more than ever desirable not to entrust the safety of the ship, or, at least, her power of keeping in motion for the purpose of helm-control, to the propeller or shafting of a single screw. On the double-screw system, each is driven by a separate set of machinery, and, if one breaks down, the vessel can make way, at diminished speed, with the other apparatus. In case of mishap to the rudder or steering-gear, the alternate working of the two sets of engines supplies the place of the disabled agency. Strength and security for the ocean-going steam-ship have been vastly increased by subdivision of the hull into water-tight compartments; by an elaborate system of steel deck-beams, stanchions, and supports; and by the general use of water-ballast bottoms divided into cells. Messrs. Denny & Sons, the famous Dumbarton builders, have been mainly instrumental in developing this last improvement, which gives the vessel a double-skin below, and affords safety to the interior, in case of running on rocks or other sunken obstacles.

The progress made in maritime affairs during the last 60 years is well illustrated by a reference to the state of things which existed in 1836, on the authority of a distinguished official of the Board of Trade in London. Mr. Thomas Gray, C.B., in an address delivered in 1886, on the subject of maritime legislation, dealt with the mischiefs that were operating in the year before the opening of Victoria's reign. He showed first that, at Lloyd's, the great association of "underwriters" or ship-insurers, in London, British

ships were then classed solely on age, or according to the port of building. This great and long-existing organization, which, among other services, collects and distributes marine intelligence of every kind, and promotes every measure for preserving life at sea, was incorporated in 1871 by an Act of Parliament. Their various publications are of infinite use to the mercantile community; their agents are found in every port, and their signal-stations, or watchers, on every coast, throughout the civilized world. In regard to Mr. Gray's statement, Lloyd's Register, a society maintained by the shipping community for the classification of vessels according to their efficiency and strength for the carrying of cargoes, now employs about 150 ship and engineer surveyors in the United Kingdom, and about 130 at foreign ports. About 90 per cent of the vessels built in this country are constructed under the supervision of Lloyd's surveyors, and the ships are classified and registered according to their report. The boilers and machinery of steamships are also inspected during and after construction, and anchors and chains, and the steel for boilers and ships, are tested in accordance with various statutes. The A 1 and other Lloyd's classifications for wooden vessels, and 100 A 1, 90 A 1, &c. for iron and steel ships, are the marks which indicate to passengers and shippers various degrees of probable safety for person and property, so far as the ship's material condition is concerned. This organization, in its present form, began to exist in 1834. The removal of restrictions on trade, noticed by the same speaker, has been already dealt with, and it has been seen that we have long left behind the time "when British ships were so faulty in design, and as sailers so slow, that British shipowners feared free-trade, because they knew that successful competition on equal terms with foreign ships was impossible". The inefficiency of charts, a prolific source of danger in pre-Victorian times, has been to a very large extent remedied by the labours of surveying, and by the engraving of these marine maps, performed under the control of the Hydrographical Department at the Admiralty. In 1887, eleven vessels, including eight of the royal navy, were busily engaged in examining and delineating seas and coasts, with depths of water, rocks, sandbanks, and every needful detail, in various parts of the world. In the five years ending with 1886 nearly 700,000 charts had been sold, below cost-price, by the Admiralty, to the navigators in our

mercantile marine. The shallowness of trading-harbours; the non-existence of harbours of refuge; the paucity of docks; the navigability of the Clyde, Tyne, and Tees only by small vessels, even at high water; the drunkenness and incompetency of the ordinary run of officers in the mercantile marine; the lack of examination of masters, mates, and engineers; the absence of side-lights in ships at sea and of an international maritime "rule of the road"; the want of lifeboats and of rocket-apparatus; the mis-management of lighthouses; the non-inquiry as to wrecks and as to the responsibility attached thereto; the non-protection of British seamen against "crimps" or "runners", land-sharks who keep sailors' boarding-houses, and, pretending to find employment for their lodgers, mercilessly plunder them of their money, and ruinously pander to their follies and vices; the lack of legislative protection for mariners against bad and insufficient food, and the tyranny of masters and mates at sea, and the unseaworthiness of vessels; all these evils, the shameful results of unwisdom, indifference, selfish-ness, cruelty, and greed, have either been wholly removed or largely redressed by the general progress of morality and civilization, as displayed in the benevolence which founds and manages sailors' homes, or by the commercial energy and enterprise of a growing community, or by the improved administration of affairs at the Board of Trade and the Trinity House, or by the beneficent legislation contained in a series of Merchant Shipping Acts passed between 1854 and 1888. We proceed to give details with regard to some points that have been mentioned in this lengthy category of features found in those "good old times" for seamen and their fellow-citizens.

The safety of navigation on the coasts of the British Isles has been, in the first place, largely increased by the indication of dangers through beacons and buoys. For England and Wales the Corporation of the Trinity House, in London; for Scotland, the Commissioners of the Northern Lighthouses; for Ireland, the Ballast Board of Dublin; these are the authorities that provide all beacons, of stone, timber, concrete, or iron, on the open sea-board, or on estuaries, or on firths, lochs or loughs, used as harbours of refuge for shipping. Boards of trustees undertake the same duty on navigable rivers. Some of these useful warnings, erected on rocks or sandbanks, have cost from many hundreds to some

thousands of pounds, and are familiar objects to tourists by sea. In the Clyde, the Lighthouse Trustees have introduced the lighting of iron and stone beacons by gas, controlled by a stop-cock on shore. Instances of this improvement may be seen off Port-Glasgow, on a sandbank, and on the Gantocks Rock, near Dunoon. Since 1883, a systematic scheme of buoying navigable channels to indicate the presence of hidden dangers to shipping has been adopted, by agreement amongst the various nautical authorities, throughout the British Isles. Here again, the Clyde showed the way to improvement when the Lighthouse Trustees, in 1880, first introduced the lighting of buoys by compressed oil-gas, fitted to a small dioptric apparatus, and burning constantly without renewal for a month. Twelve such indicators, at least, are moored in the Clyde, and eight or more in the Thames. For warning by sound, there are bell-buoys, with clappers moved by the waves, and the ingenious Courtenay automatic sounding buoy, in which a large, deep-toned whistle is placed at the top of a tube descending below the water, and taking in air as the buoy rises and falls with the sea-movement. The whistle is thus made to act, with a sound audible at from 1 to 7 miles. One of these buoys lies at the east end of Inchkeith island, in the Firth of Forth.

The noble structures called Lighthouses are now, for England and Wales, under the management of the Trinity House, with a partial control in the sister-countries, which have their special Lighthouse Boards. The London society, incorporated by Henry VIII.'s charter in 1514, and with powers extended under later sovereigns, assumed its present wide authority in 1836-37, when a statute, by compulsory purchase, vested in the Brethren all rights in lighthouses previously held in private hands. Under various Merchant Shipping Acts, they have also been charged with the duty of removing wrecks round the coast if dangerous to navigation, and with additional powers for the appointment and licensing of pilots. The use of lighthouses in some form or other, dates from very early times. On the heights at Dover Castle may be seen the well-preserved brick-and-tile work of a Roman *pharos*, or lighthouse, erected probably in the second century of the Christian era, and this had been preceded some centuries by the famous Pharos of Alexandria. The due development and organization of the modern lighthouse-system came with the earlier days of the nineteenth

century, at which date there were but 25 lighthouse-stations and six floating-lights on all the English coast, against about 900 coast and harbour lights, in 1895, around the British Isles. The earlier modes of warning vessels were by timber or coal burned in grates at the top of towers, or by rude oil-lamps, or candles of tallow or wax, placed inside glass. The famous Eddystone Lighthouse erected by Smeaton in 1757-59 on a group of rocks between Start Point in Devonshire and the Lizard in Cornwall was lighted at first with 24 candles, each weighing nearly half a pound. This building, of which the upper portion now adorns the Hoe at Plymouth, was replaced in 1882 by a new structure designed by Sir J. N. Douglass. In this long interval, candles had given way, by degrees, to lamps burning animal, vegetable, and mineral oils, with burners containing, as improvement went on, from two to nine concentric wicks, giving a corresponding increase of illuminating power. The use of parabolic reflectors, towards the end of the eighteenth century, and of a revolving frame for the lamps, gave a great increase of power and utility. The concentration by these reflectors of the rays issuing from lamps placed in their *foci*, is known as the catoptric or reflecting system, and was quickly adopted in Britain after its first employment in France. The eminent French natural philosopher Augustin Fresnel invented and employed, in 1822, the dioptric or refracting system, in which the illumination is due to a central lamp, the rays of which are transmitted through a combination of lenses around it. The same ingenious man contrived a combination of the two systems, and by 1849 Messrs. Alan and Thomas Stevenson had devised prisms on the holophotal system, for catching and utilizing the whole of the light-rays issuing from the lamp. Other improvements, and the fine glass apparatus, in various forms of mirrors and prisms, constructed by Messrs. Chance, of Birmingham, have given great efficiency both to fixed and to revolving lights. Gas has been employed with good results as an illuminant in lighthouses, and great power has been developed in this agency by concentric systems of jets invented by Mr. Wigham of Dublin and by Sir James Douglass. The electric light was first shown in 1858 from the South Foreland lighthouse, on the cliffs near Dover, and this illuminant is employed at the two Forelands, in Kent; at Souter Point, in Durham; at St. Catharine's Point, Isle of Wight; at the Isle of May, in the Firth of Forth; and at the Lizard, in

Cornwall. Some of these lights are, in clear weather, visible for about 30 miles, but for ordinary purposes paraffin has been proved to be the most suitable and economical lighting material. Great care is now taken for the mariners who approach our coasts. The most important points are marked by lighthouses of the first order; lights of secondary power show turning-points in the navigation; and, finally, harbour-lights guide the ships into a place of absolute safety. The lights are distinguished from each other by being fixed, or moving, with flashes at various intervals of time, and by variations between red and white. The ingenuity of lighting apparatus is well shown at the splendid Start Point lighthouse, on the south coast of Devon, where an intercepting mirror catches and utilizes rays flung downwards from the lantern, by throwing them out to sea on to a dangerous reef about half a mile from the rocks at the foot of the cliff on which the lighthouse stands, thereby warning mariners to take plenty of sea-room outside the illuminated water. Among the finest of these structures on the British coasts, besides those already named, are the Bell Rock, designed by Robert Stevenson and Rennie, and completed in 1810, opposite the mouth of the Tay, in Scotland; the Skerryvore, completed by Alan Stevenson in 1844, on a most dangerous reef south-west of Tiree, in the Inner Hebrides; and the Bishop Rock, off the Scilly Isles. The list of safeguards for mariners in British waters is completed by the light-ships, strongly-built craft moored in dangerous places where lighthouses cannot be erected, and by the fog-horns, or sirens, the fog-bells, and hand-struck gongs which, both on lighthouses and on light-vessels, indicate danger in weather that obscures the lights. The powerful sirens are trumpets acted on by compressed air, which is moved by hot air, steam, gas, or oil utilized in engines.

The huge barriers of stone or concrete called breakwaters are constructed either for the purpose of affording additional security against winds and waves to some existing natural haven, or of creating a harbour of refuge on an exposed coast. Up to nearly the end of the eighteenth century, the British Isles were very deficient in artificial provision for the defence of shipping. There were few ports thus protected by human labour. At Hartlepool, in Durham, and at Arbroath, in Forfarshire, there were harbours created in the thirteenth and fourteenth centuries, and, during

Stuart times in England, Whitby and Scarborough, on the Yorkshire coast, had their ports protected by the throwing out of roughly-made piers. The genius of John Smeaton, who was born near Leeds in 1724, and so early as 1753 was distinguished by the letters F.R.S. appended to his name, did something to remove reproach from the country then rising into commercial pre-eminence. We have seen his great achievement at the Eddystone reef, completed in 1759, and he was afterwards largely concerned at Ramsgate, on the east coast of Kent, with the harbour of refuge which was made there between 1750 and 1795, inclosing 51 acres within two sea-walls or piers nearly 700 yards and over 500 yards in length. On a large scale, British breakwaters and harbours belong solely to the nineteenth century. The first great work of this kind was the Plymouth Breakwater, built across the mouth of the Sound, which was greatly exposed to storms from the south and south-west. The design and execution of this famous feat of engineering were due to John Rennie, born in East Lothian in 1761. His mechanical genius was first displayed in the service of Messrs. Boulton and Watt, at Soho, near Birmingham, and he then became famous in connection with bridges and canals. We have seen that the Bell Rock Lighthouse was erected by him in conjunction with Stevenson. Among the important docks designed by Rennie, and wholly or partially superintended by him in their execution, were the London Docks, the East and West India Docks at Blackwall, on the Thames, the Hull Docks, the Prince's Dock at Liverpool, and those at Dublin, Greenock, and Leith. Many harbours were improved by his skill, as also the royal dockyards at Portsmouth, Chatham, Sheerness, and Devonport. The grand achievement at Plymouth was commenced in 1812 by the formation of a vast subaqueous mound composed of large blocks of limestone deposited by means of vessels fitted with trapdoors. The work was very arduous and slow in progress. In November, 1824, a violent storm overthrew nearly 800 yards of the finished bulwark, and it was not completed until 1841, when more than 3,000,000 tons of stone had been used, at an expense of about 1½ millions of pounds. The designer died in 1821, and the breakwater was finished under the care of his sons, George and John Rennie. The width at the top is 45 feet, this part and the sloping sides being covered with cemented masonry, including huge blocks

of dressed granite. The whole forms a mass of nearly a mile in length, composed of a central 1000 yards, with wings, at a slight angle, each 350 yards long. At the base, the submarine mountain of stone is 400 feet wide. At each end, between the breakwater and the shore, is a channel about half a mile in width, with depths, at low water, of 22 feet in one and 40 feet in the other. More than 1100 acres of water-space are made secure in all weathers as anchorage-ground between the breakwater and the adjacent shores of Devonshire and Cornwall. The two other chief engineering works of this class in the British Isles are at Holyhead, in Anglesea, and at Portland, in Dorsetshire. The great Welsh breakwater, designed by Mr. Rendel, was begun in 1847 and finished in 1873, the completion, after Rendel's death, being due to the late Sir John Hawkshaw. A valuable harbour of refuge has thus been provided for vessels caught in the storms of the Irish Sea. The stone-foundation, of material quarried in the mountain close at hand, was deposited from wagons run out upon a staging of timber, and the completed work is protected by a vertical wall, 20 feet in thickness, and carried up to 40 feet above low-water level, with an inside roadway of 40 feet width. An outer anchorage of 400 acres, with a depth of from 20 to 50 feet, is thus protected, while the inner harbour, containing above 260 acres, is from 18 to 40 feet deep. The whole cost of this gigantic undertaking, a mile and a half in length, with a lighthouse at the head, amounted to £1,300,000. A still more important and valuable piece of engineering is seen in the Portland Breakwater, which has created, in the English Channel, about midway along our southern coast, one of the finest, partly artificial, partly natural, havens in the world. Between the peninsula commonly known as the Isle of Portland (really connected with the mainland by the famous and unique Chesil Bank or Beach, of shingle and gravel) and the Dorsetshire coast near Weymouth, lies the anchorage known as Portland Roads. In its natural state, this roadstead was already of high value, having an area of 1200 acres, without a rock or sandbank in its waters, and of ample depth at lowest tide. The Chesil Bank and the high-rising Portland gave good protection from wind and sea to south and west, but the anchoring-ground lay fully open towards the east, an oft-occurring wind, and, for the sake of coasters and of the large outward and inward commerce by the Channel, the works for com-

plete shelter were begun in 1849. Abundant material was at hand in the Verne hill, nearly 500 feet in height, composed, like the whole peninsula, of oolitic limestone, which had been quarried since the seventeenth century, and furnished the stone for Whitehall, St. Paul's Cathedral, and other important buildings in London. The labour of the convicts, from 1200 to 1500 in number, at the great prison on the Verne, opened in 1848, was largely employed, and the work proceeded, on the same general lines as those at Plymouth and Holyhead, with unusual rapidity and ease. Rough stone, in wagons descending from the lofty quarries by their own weight, along timber-staging extended from the north-east corner of the peninsula, firstly almost due east, and then, after half a mile, curving round to due north, was deposited to form the usual vast subaqueous bank, which was crowned by finished vertical masonry. Portland Breakwater, more than two miles in length, with an opening for the ingress and exit of craft, is protected at each end by iron forts of the most formidable kind, and the Verne is surmounted by Fort Victoria, whose heavy ordnance has a clear range of fire towards every point of the compass.

A most costly work of the same class has been that at Dover, begun in 1847, and by 1888 carried out for 2100 feet into water of 45 feet depth at low-tide. Lack of rough stone for a foundation-mound caused the work from the bottom to be composed of stone laid by divers, with blocks of concrete in the interior, and a superstructure of enormous masses of masonry. About £700,000 has been spent on a work mainly serviceable for the steamer-traffic to France and Belgium. Good shelter is afforded against the prevailing south-westers, but the coast is open to the east and north-east. The breakwater at Alderney, in the Channel Islands, has been, for its serviceable quality, by far the most expensive of all. A cost of above 1¼ millions, from 1847 to 1884, including large sums for repair of damage due to storms, has provided a work 4500 feet long, sheltering an anchorage from west and south-west gales. The use of concrete, made from Portland cement mixed with sand, gravel, and broken stone, has of late years greatly aided the construction of breakwaters by deposition in the form of large blocks, or in boxes, or in bags. Concrete has thus served for marine protection in extensive works at Aberdeen, Peterhead, and Fraserburgh, on the east coast of Scotland.

The development of docks, in various forms, during the period under review, has been very extensive and important. The chief results of energy and enterprise, in this direction, in the British Isles, are to be seen on the Thames, the Mersey, the Clyde, the Bristol Avon, the Wear, and at Penarth and Cardiff, on the estuary of the Severn. On the north side of the Thames, between London Bridge and Barking Reach, there are now nearly 400 acres of docks, some of which have been already named. The most important are the Victoria and the Royal Albert Docks. The Victoria main dock has 74 acres, with a tidal basin of 16 acres, and eight dry-docks or graving-docks for repairs. Connected with it by a channel of 80 feet width is the Albert Dock, nearly 1¼ miles long and 500 feet wide. The area is 84 acres, with a quay-length of 3 miles, and two fine graving-docks. The walls are constructed entirely of concrete, and the quays are illuminated by the electric light. On the south side of the Thames, the Surrey and Commercial Docks have a land and water area of over 300 acres. Lower down, at Tilbury, opposite Gravesend, there have been excavated, since 1880, some of the finest docks in the world. The marshy site where cattle once grazed is now occupied by the Tilbury Docks, the deepest in the British Isles, with 38 feet at high-water in the main-dock, 57 acres in extent, and an outer tidal basin of nearly 20 acres, with an extreme depth of 46 feet of water. At Liverpool, mainly during the nineteenth century, the dock-space has grown from an area of a few acres to 324, with a quay-length of nearly 22 miles. The Birkenhead Docks, on the opposite side of the Mersey, entirely the creation of the Victorian period, have about 160 acres of area, and a quay-space nine miles long. Vast works of the same kind have been constructed of late years at Avonmouth, below Bristol; on the Clyde, at Greenock and Glasgow; at Sunderland; at Barrow, in Lancashire; and at other points. The Cardiff docks will be noticed in connection with the wonderful progress of that town. Floating-docks, with a pontoon to hold the vessel, which is then raised by hydraulic or other power, are ingenious modern inventions for the reception of ships needing repair. Great iron structures of this kind, designed and made in this country, have been sent out to Bermuda and to St. Thomas, in the West Indies, and to Cartagena and Ferrol in Spain. These products of engineering skill dealing with iron have a lifting power of from 10,000 to over 16,000 tons.

Liverpool and Birkenhead are remarkable for the number and size of their graving-docks, varying in length from 500 to over 900 feet. Mr. Morton of Leith is the inventor of an ingenious repairing-slip for vessels up to 2500 tons register. This apparatus consists of a carriage with blocks working on an inclined railway extending for some distance above high-water to a sufficient depth below low-water for the flotation of vessels when the repairs are completed. The ship, floated over the cradle, is then hauled up by steam or hydraulic power.

Our last subject connected with maritime progress is the service rendered in deepening rivers, and so creating tidal harbours for large vessels, by the modern dredging-machines or dredgers. Here again, our most conspicuous examples are found in the Clyde. The great port of Glasgow, with its huge commercial liners, was made, in the present century, by dredging. In the earlier decades, at low water, the mill-workers used to wade across to their homes on the north side at about the point now marked by the Clyde-Street Ferry. The efforts at dredging were of a feeble description, but something was done to deepen the river-bed, and in 1828 the first ship, the *Earl of Dalhousie*, that ever came right up to the Broomielaw, brought a cargo of sugar from the West Indies. Lower down, some effective work was done by machines called ploughs, scooping the bed by way of its breadth with large hollow cases of iron and wood. Towards the end of the 18th century, there were seven feet depth, at the town-quays, at low water, and Smeaton, Watt, Telford, Rennie, Walker and other engineers had various schemes for improving the channel by dredging and by contractions of the river in order to cause increased scour of fresh water from above, and of the tidal volume from below. From year to year the depth was increased, and great improvement came in the use of steam-dredgers, with sharp-edged iron buckets dragged along the bottom and, filled with material, drawn up a side-ladder or a central ladder, afterwards depositing their contents, by means of shoots, into barges lying alongside, for conveyance out to a deep part of the estuary below Greenock. In 1881, a very large machine, costing nearly £20,000, was made for deepening the lower part of the Clyde. This powerful apparatus was 164 feet long, 30 feet broad, and 10 feet deep, fitted with engines of 350 horse-power. Its two sets of buckets could lift 500 tons of

[illegible] per cent. from a depth of 35 feet and the vessel being [illegible] a steam-dredger will suit as ground without a rig. The hopper-barges invented by Messrs. Simons of Renfrew [illegible] in lieu of depositing the material dredged up into the hold or hopper of the vessel, which steams away with its load [illegible] deep water and discharges it by lowering the hopper-doors. [illegible] depth of deepest water [illegible] feet at high water has been secured, and the Duke Benjamin Trustees spend a very large sum annually in maintaining and extending the existing [illegible] for the entry of large vessels. In the Mersey, the Thames and the Tyne, in the Liffey and other rivers, like results have [illegible] improved navigable channels. At Dublin [illegible] but more was [illegible] about six feet of water on the bar at the building of [illegible] has increased a large water-area [illegible] a depth of the ebb-tide flow by degrees cut the bar down to a depth [illegible] feet at low water of 21 feet at spring-tides high-water. The aggregate amount of dredging operations may be judged of by the fact that in the year 1300,000 cubic yards of material were taken up in the Tyne and cast between 1844 and 1845 rather more than 20 millions of cubic yards were thus removed.

CHAPTER VII.

RAILWAYS BEFORE THE RAILWAY ERA—EARLY CONVEYANCES, AND THE INVENTION OF THE LOCOMOTIVE.

Improvement in Roads—Pavements and Paving—Streets and Side-walks in towns—The Stage-coach—Stage Contractors—Mail-coaches and mails—The omnibus and cab—Progress in stage-coaching—Serious interference by the railway system—Its beginnings—Outdoor Tramways—Ridiculous objections to railways—Opening of the Manchester and Liverpool Railway—Rapid extension of lines—Railway habits and regulations—Improvements in speed, cheapness, and comfort of railway travelling—Difficulties in railway engineering—Viaducts—The Britannia Bridge and Forth Bridge—Railway tunnelling—The Underground Railway in London—Subterranean railways—Bridges and foreign canals—The Manchester Ship Canal—Railways on the Continent—Diving bell and dredge—Artificial islands.

Until the 19th century the British Isles possessed few good roads. The stage-coaches, stage-wagons, post-chaises, private carriages, and travellers on horseback, as well as footsore way-

farers and herds and flocks, were forced to be content, in most parts of the land, with roads that were never easy in the best of weather, and in winter were rough with deep miry ruts. Our rude forefathers of the 18th century did not know how to make ways for traffic from town to town that, in all seasons, should present a fairly smooth surface, and a proper shape for preservation and repair. Two Scots arose who, early in the 19th century, began the vast improvement that has since been attained. John Loudon Macadam, whose name has been long preserved in the word "macadamise", was born at Ayr in 1756. Successful in trade, he purchased an estate in his native county, and about 1810 he began to make experiments in constructing roads. With that view he travelled many thousands of miles, and expended some thousands of his private fortune. The prevailing method of forming roadways was that of laying down broken stones of different sizes, the result being that, in course of time, the smaller ones sank, and the larger ones at the top made a rough and risky track. Macadam saw that for solidity at the top angular pieces of stone, of a limited and fairly equal size, should be used, so as to dovetail into each other, and not roll about like a gravel covering. He scattered his road-metal to a depth of from six to ten inches in pieces of stone so sized as to pass easily through a ring 2½ inches across. For this covering he preferred to have a soft yielding foundation, into which the weight of traffic, or the use of rollers, pressed the stones down, and gradually formed a hard, firm, and smooth upper face. In 1816, as surveyor of the British Turnpike Trust, he made roads so good and cheap as to become a high authority on the subject, and the founder of a system extensively followed. In 1827 he became Surveyor-general of Metropolitan Roads, and received £10,000 from Parliament in return for his private expenditure and successful labours. A rival road-maker of the same period, and a man whom we shall see in other capacities, was Thomas Telford, born in 1757 in Dumfriesshire. In 1803, after having worked as a mason in Edinburgh, and then become a civil-engineer of repute, he was appointed engineer to the Commissioners for making roads and bridges in the Highlands. He constructed above 1000 miles of road there and in Lanarkshire and his native county, with about 1200 bridges, and was the engineer of a new highway from London to Holy-

head. His system of road-making differed from Macadam's in laying a solid foundation of large stones, to a depth of from three inches at the sides to nine inches at the centre, and covering these with broken stones to a depth of about half a foot. His plan resulted in highways of great durability, and his scientific skill was displayed in his formation of easy gradients and of a proper curve on the surface from centre to sides.

In the towns of George the Third's days, the streets and foot-paths were but rudely paved. The roadways were either full of holes whence, in muddy weather, the dirt was splashed by vehicles upon the foot-passengers, or were paved with ill-cut cubical stones that, in the passage over them by carriage, severely jolted those who were conveyed to and fro. The foot-paths were covered with ill-laid round-topped stones, called "petrified kidneys" by sardonic wits, and grievously uneven and uncomfortable to tread. During the Victorian age, municipal improvement has given far greater ease both to men and animals by various changes in the mode of paving both the carriage-ways and side-walks. Horses and vehicles now traverse either well-laid duly-squared granite-cubes, placed on a solid concrete bed, with the interstices filled with sand, and finished off with asphalt or lime or cement; or pass quickly along a roadway composed of concrete, or of asphalt made from bituminous limestone reduced to powder, and mixed, in a boiling state, with dried sand, gravel, or triturated limestone; or of blocks of wood prepared with tar. The foot-passengers in cities, towns, and their suburbs have the benefit of pavements that are always smooth and, in rainy weather, but slightly moist and muddy, made of large, smooth, even-laid slabs of stone, or of concrete, or of the asphalt above described, or of coal-tar mixed with gravel, lime and sand.

When we turn to the vehicles used for passenger-conveyance in country and town before the days of steam-carriage, we find that the coaching-system, during the earlier decades of the 19th century, was brought to a high degree of efficiency. Macadam and Telford provided excellent roads for better-built coaches, drawn by teams of stronger and swifter steeds, driven by coachmen of the utmost skill. The best days of coaching were from 1820 to 1840, when management, and speed, and equipage, and all other points that tended to perfection received their highest development. In 1836, 54 mail-coaches, besides large numbers of the

ordinary "stages", were running in England, 30 in Ireland, and 10 in Scotland. The quickest of these public conveyances maintained an average speed, including stoppages, of 12 miles an hour, and it was a sight worth seeing to view the change of teams, at the end of a stage, effected in two minutes by the nimble staffs of men employed at the inns. The reins were often handled, with the regular coachman's ready leave, by skilful "whips" among the passengers. A very large amount of capital was invested in the service at the time when the railway-trains began to drive the coaches, one by one, from the roads, consigning the villages on the lines of traffic to their pristine dulness, turning prosperous inns into road-side "publics", emptying stables of their sleek-skinned occupants, and despatching an army of coachmen, guards, stable-helps, and yardmen to other modes of work, or to the hospitality provided by the new Poor Law. We must notice that in Ireland, during this and a later period, much advance in convenient passenger-traffic was due to an enterprising man of Italian birth. In 1815, Charles Bianconi, a native of Lombardy, established a public conveyance between Clonmel and Cahir, two Tipperary towns 11 miles apart. He was aided in his venture by the cheapness of horse-flesh and jaunting-cars, brought to sale in unusual numbers through the carriage-tax, and he was soon induced to extend his sphere of operations. In the third decade of Victoria's reign, the cars owned and horsed by Bianconi were daily traversing 4000 miles of Irish roads, and the far-sighted, energetic Italian retired with a large, well-earned fortune.

A vast improvement in conveyances for passengers through the streets of towns and on suburban roads has come since the close of the Georgian age. The "hackney-carriage" for public use began with Stuart times in England. In 1715, there were 800 of these licensed vehicles in London. Early in the 19th century, the cab, a name shortened from the French *cabriolet de place*, or carriage on a "rank" or "stand", was introduced from Paris, and eight of the new carriages were licensed in London. In the days of George the Fourth, these two-wheeled cabs were built to hold two persons inside, besides the driver in another partition. There was a moveable hood as covering, and the novelty soon became popular, and displaced the old hackney-coaches. A new form of cab carried two passengers facing each other, the driver being

seated above, and the vehicle being entered by a door in the rear. The four-wheeled cab of the present day came into use about 1840. The "hansom", styled in its full form "hansom patent safety cab", was named from its inventor, the architect of the Town Hall at Birmingham. At first made with a square body, on wheels of the same height as the carriage, this form of conveyance has, since the patent of 1834, received many improvements. There are now above 7000 hansoms in London, with more than 4000 four-wheelers, and this quick and convenient style of locomotion has been adopted in all the chief provincial towns. The use of these public carriages is regulated and controlled by statutes, and by municipal authority, for the protection of those who employ their services.

In the omnibus, the road-car, and the tram-car, we have yet more important inventions of modern days for the benefit of travellers in town and suburb. The public coach, called *omnibus*, "for all", from the dative case plural of the Latin word *omnis*, came to this country from Paris. Used there, for a brief space of time, in the reign of Louis the Fourteenth, and then laid aside, this form of vehicle was revived in the French capital in 1820, and quickly gained favour with the public. In the earlier days of the 19th century, men of business reached London from the suburbs by stage-coaches. It was in 1829 that Mr. Shillibeer, formerly a coach-maker in Paris, started the London omnibus as a three-horse vehicle, carrying twenty-two persons inside. The twelve-inside bus, with room for two passengers outside, appeared twenty years later, and then came the outside seats along the centre of the roof. Many improvements led to the existing light, easy-running, cheap, and convenient vehicles used in London and all great provincial towns. The "Road-Car Company" in London introduced the comfortable seats on the top, facing forward. About 1870, after a failure ten years previously in the ill-laid lines of an American speculator, George Train, the tramway, with its smooth-running, roomy cars, became a British institution. By 1880, there were about 500 miles of street-railway in the kingdom, and now there are more than double that number, with cars drawn mainly by horses, in some few cases propelled by steam or by electricity, and, in the latest improvement, by means of a cable laid and travelling in an underground pipe, and used by the car through a grip attachment that can be relaxed at will for stoppage. This method of employing

force has the great advantage of enabling cars to ascend steep gradients where horses could be of no avail. This American invention, introduced in London in 1884, has been adopted in Bristol, Birmingham, and Edinburgh, and has the prospect of large extension.

In the bridges erected within the British Isles since 1801 we have, apart from those constructed on railways, some of the finest achievements of modern engineering. The first use of iron for these indispensable aids to continuous land-traffic has been already noticed under the 18th century. The cast-iron arch was, by degrees, superseded by beams or girders in the same material, or, by the latest improvements, in the far stronger substances, wrought-iron and steel, with varieties of form in bow-string girders, lattice girders, and other modifications. Of our stone bridges built in the present century, besides those in London, which are noticed elsewhere, we have a fine example in the Grosvenor Bridge crossing the Dee at Chester. This work, designed by Mr. Harrison, a local architect, and opened in 1832, after five years of labour, has one segmental arch of 200 feet span, the second largest in the world erected in stone. The bridge of five arches over the Tweed at Kelso, each with a span of 72 feet, was a specimen of the novel semi-elliptical form. It was opened in 1803, and was the work of John Rennie, then rising into repute as a bridge-builder. Another new feature in this structure was its level roadway, a striking contrast to those of olden times. The stone bridge at Gloucester across the Severn, designed by Telford, and opened in 1827, has an elliptical arch of 150 feet span. A wholly different principle of bridge-building is seen in the system of suspension-chains or wire-ropes, making the bridge independent of central supports, and not interfering with the waterway. The whole weight rests upon the piers at the ends, the roadway being suspended from the chains or ropes attached to natural rock or to masses of masonry or iron at each side. A noble example is that of the Menai Bridge across the strait from Carnarvonshire to Anglesea. Designed by Telford, and completed under his direction in 1825, it spans the water for 580 feet, with a height above it of 100 feet, and has two carriage-ways, each of 12 feet width, with a footpath, 4 feet wide, between them. The whole length of this splendid structure is about one-third of a mile, and it contains 2200 tons of iron. The Clifton

Suspension Bridge, crossing the Avon from the Bristol to the Somersetshire side, is partly made from the chains of the old Hungerford Bridge, removed from the Thames in 1860, on the extension of the South-Eastern Railway to Charing Cross. This wonderful structure has girders of wrought-iron, the chains supporting a roadway of over 700 feet span, flung across a rocky and wooded gorge of remarkable beauty, at a height of 250 feet above high-water level in the river.

A volume of essays would be needed to set forth with fulness the material, intellectual, and moral benefits derived from the railway-system of modern days. Science therein gave a new circulation to the body-politic, and a flood of fresh vigour began to pour its tide through every vein. A change has been brought over every department of social life in the abridgment of the distances which once meant not merely physical separation, but isolation, torpidity, confinement, forced abstention from variety of scene and surroundings, to millions of those who were the chief agents in creating the wealth of the nation. George Stephenson, the chief hero of this most happy and genial of social and industrial revolutions, he and his able and energetic compeers and followers, were engaged upon a work whose marvellous effects are co-extensive with the bounds of the civilized world. A great orator and politician, John Bright, once expressed the opinion that railways had rendered more services and received less gratitude than any other British institution. This modern facility of locomotion with cheapness, convenience, and comfort has made travelling, once the privilege of a small and wealthy class, the birthright of a vast majority of British citizens. The lad who, on leaving his country parish to push his way in some great distant town, was parting with his parents and his home for a term of years or even for life, can now spend his Christmastide in his native village, or can receive the visit of his kinsfolk in the wealthy and splendid emporium of trade that, in former days, they never could have hoped to see. The dwellers inland have, in millions, been permitted to view the sea that beats upon the shores of their island home. Millions of persons have been enabled to see with their own eyes, and to become possessed for life of mental photographs recalling at will the beauteous landscapes, the stately shrines, the historic scenes, the superb ancestral abodes, of a country rich in that which can charm human

vision and supply interesting matter, of every kind, for the exercise of human memory and thought. Railways have brought about, in large measure, that true "equality and fraternity" which arises, not from the feverish, foolish, unreal vagaries of socialistic dreams, but from the union of town and country upon a level of wider intelligence, sympathy, and knowledge, ministering by commercial intercourse to material wants, and to mental progress by the personal acquirement, through eye and ear, of new ideas. The cheapening of products of every class, in the diminution of the costly freights by highroad and canal, and the creation of new wealth, for the benefit of the whole community, are among the most conspicuous results of the vast development of steam-traffic by land.

The humble precursors of the modern railways were the roads called tramways, used for the saving of human or horse-labour in the lessening of friction between wheel and road. Collieries of the 17th century had tram-roads of timber for carts with grooved wheels that fitted the rail, and in the 18th century such roads were commonly used in coal and other mining districts. An iron tram-road or railway was laid down in 1760 at Coalbrookdale, in Shropshire, and others were formed in Derbyshire and elsewhere. In 1811, nearly 200 miles of such road existed in South Wales, and cast-iron rails were introduced for wheels with a grooved tire. It was this use of tram-roads, along with the high charges for freight on canals, that made thoughtful men aspire to railroads for steam-traffic. The hindrance to business was very obnoxious when merchants could get only a small portion of their goods forwarded by water-traffic, and mills stood idle while the raw material from abroad remained in the warehouses. Bales of cotton which had been brought across the Atlantic in twenty-one days were often delayed for six weeks at Liverpool before they were sent on to Manchester. A rude locomotive-engine was already in existence. The just renown of George Stephenson must not make us forget the credit due to Richard Trevithick. This ingenious Cornishman, in 1808, exhibited a steam-carriage in London, and his experiments and devices were largely concerned with the evolution of the high-pressure locomotive. The first steam-engine that succeeded in drawing wagons on a smooth rail was that called "Puffing Billy", patented by William Hedley in 1813, and still existing in the museum of the Patent Office, in Chancery Lane, London. This

ancestral locomotive was in constant work from the above year until 1872 at a colliery near Newcastle-on-Tyne. The real inventor of the swift modern engine for land-traffic was George Stephenson, born near Newcastle in 1781, who, beginning as a pit engine-boy at *2d.* per day wages, rose to be engineman in the service of Lord Ravensworth. His mechanical genius enabled him to complete a successful locomotive in 1814, and he soon introduced the improvements of a blast, worked by waste steam, to fan the furnace-fire; of direct connection between cylinders and wheels; and of the horizontal rods connecting the wheels. The multitubular boiler, invented by Booth, gave a great increase of heating surface; and thus step after step towards perfection was made.

The first English railway worthy of the name was the Stockton and Darlington, opened for public use on September 27th, 1825, when an engine, constructed and driven by Stephenson, drew trucks, with a weight of 90 tons, at from 10 to 15 miles an hour. Mr. Edward Pease, of a Quaker family at Darlington, was the chief promoter of this notable undertaking. Passengers were, to some extent, carried upon this line, but it was mainly used for minerals and goods. Its immediate commercial results were startling in that age. The price of carriage for merchandise fell from *5d.* to $^1/_5$th of a penny per ton per mile, and for minerals, from *7d.* to 1½*d.* per ton for the same distance. Coals at Darlington were sold at 8*s.* 6*d.* per ton instead of 18*s.* A great effect was produced on the public mind, and the merchants of Liverpool and the mill-owners of Manchester were not of those who were least impressed. About 250 leading men of the port on the Mersey had already projected a line to Manchester, and, after Stephenson had given evidence before committees of the House of Commons, an Act was obtained. He won the prize of £500 offered by the directors for the best locomotive, and his engine, the immortal *Rocket*, in October, 1829, drew a coach with 30 people at the rate of 30 miles an hour. Presumptuous persons, of an antiquated turn of mind, and some who should have known better, had poured scorn upon the project of the Manchester and Liverpool Railway. It was no wonder, perhaps, that old Lord Eldon expressed his "sorrow that the people of the north country had gone mad on the subject of railways", and denounced the "absurd and ridiculous prospect that was held out, of locomotives travelling twice as fast as stage-coaches". It

was only to be expected that the *Quarterly Review*, in 1825, should anticipate that "people would as soon allow themselves to be fired off upon Congreve-rockets as trust themselves to a machine going at the rate of twenty miles an hour". The enlightened Lord Brougham, in 1830, wrote with indignation of "the folly of seven hundred people going fifteen miles an hour in seven carriages". There was a man at Liverpool who vowed that, if anyone could make a locomotive go ten miles an hour, he would afterwards eat the wheel in a stew. Prophets of evil were sure that the breed of horses would die out for lack of use, that cows would not be able to graze in the fields near the lines, that the poisonous air from the engines would slay birds in their flight, and that pheasants and foxes could no longer exist. On September 15th, 1830, the Manchester and Liverpool line, the first regular passenger-railway in the British Isles or in Europe, was opened with a triumphal double procession of carriages, drawn by engines driven by George Stephenson, by his son, Robert Stephenson, by Joseph Locke, and other men destined to play a distinguished part in the development of railways. As is well known, the enjoyment of the day, in which the Duke of Wellington, as Prime Minister, and Peel, the Home Secretary, took part, was marred by the violent death of Mr. Huskisson, the pioneer of Free Trade. The success won on this great day of our history was followed up by the construction of other lines. For ten years the Stephensons and others were engaged in making railways in the Midlands, the north, and the north-east of England, and from London to Birmingham, until 1800 miles of railway were uniting the capital with Berwick, and Yarmouth with the towns of the centre and west. For a long time, however, prejudice in many quarters waged war against proved success and practical good. Towns objected to have railways running near them. When the Great Western Line was being laid out, just prior to the "forties", the educational authorities at Oxford and at Eton would have no branches made to those places. The dividends paid by the new companies were very influential in removing objections, and the landowners, who had at first, in some cases, resisted railway-surveyors by force, became eager to have a line running through their property. The great rush in favour of the new system, styled the Railway Mania, has been noticed under the events of the period. We may here mention that economy of

fuel, and increase of speed and power, in the railway-engine, have been obtained by a succession of ingenious improvements, including adaptations of the "compounding" and "expansion" system, as regards cylinders, that has been described in connection with marine-engines. The *Rocket*, weighing 4½ tons, has been developed by changes of detail rather than of any important principle, into the grand express-train locomotive that weighs 75 tons, and runs, at an average mile per minute, for 50 miles together. The question of gauge, or the width between the parallel lines of rails, was finally settled by Act of Parliament in 1846, for all future British lines, at 4 feet 8½ inches, the measurement adopted by the Stephensons, and most other engineers, from the tram-road gauge. The "Battle of the Gauges", between the narrow and the broad, ended in the victory, as we have seen, of the narrow-gauge system, after Brunel, on the Great Western, had adopted the seven-foot, since exchanged, throughout the 2000 miles of that extensive railway, for the gauge that suits the other lines in connection. The broad-gauge finally vanished from this country in May, 1892.

The work performed in the construction of British railways by our stalwart navvies, with pick and spade, aided by steam and by explosives unknown to men of old, reduces to insignificance the most renowned achievements of ancient engineering. A competent authority, by careful calculations, has found that the labour involved in forming the earthworks of the original London and Birmingham Railway exceeded that put forth in erecting the Great Pyramid of Egypt by the effort needed to raise 9,000,000,000 (nine thousand millions of) cubic feet of material, as heavy as the stone of the Pyramid, to a height of one foot. We read that the Pyramid employed a hundred thousand men for 20 years; the railway occupied one-fifth of the men for less than one-fourth of the time. Before referring to some of the more picturesque and important engineering works produced in the development of our vast existing railway-system, we may note some matters connected with the working. The railway-ticket was invented by a booking-clerk named Thomas Edmondson, who, in 1840, pondered on the amount of time and trouble and liability to error involved in the work of tearing off a piece of paper from a sheet, and filling up, with pen and ink, the form for every traveller's use. His sphere of work was a little station on the line between Newcastle and

Carlisle, and, as he walked in a field in a leisure hour, the "railway-ticket", in its whole scope and details, came into his mind. With the aid of an ingenious watchmaker, his friend, he constructed, and then patented, a machine for printing on a piece of cardboard the date, the name of a station, and the class of carriage. He let out his patent on the profitable terms of 10*s.* per annum per mile paid by each company that used his apparatus. The earliest signals in use were flags by day and hand-lamps by night. In 1834, on the Liverpool and Manchester line, a red or white lamp was shown at night on the top of a post reached by a ladder. A few years later came poles about 12 feet in height, with discs and lamps turned through an arc of a circle by a pointsman with a lever at the base. By degrees came the colours, red, white, and green, on signal-arms and lamps, with varied meanings for the semaphore-angles. In 1846, "distant" signals were introduced, and in 1859 the valuable "interlocking" system of points and signals which did so much to diminish railway accidents. The use of the telegraph from one signal-box to another, begun in 1853, protects a train throughout its journey by the system of blocking each section of a line to a coming train until a train within the section ahead has passed outside its limits.

The improvement of brakes on the engines and in the guard-vans has been a prolific source of safety to trains. The early forms of brakes, then, as now, pressing blocks of wood against the tires of the wheels and setting up a friction which checks the speed, were not very efficacious. In course of time, after numerous experiments, great improvements were made, and blocks of cast-iron are now applied at will to every pair of wheels in a train, being worked by compressed air either on the vacuum or the pressure system, in both of which air acts through a cylinder placed under each carriage, and works the levers that apply the brake-blocks. The Westinghouse pressure-brake, named from the inventor, a mechanician of Pittsburg, in Pennsylvania, is one of the most efficient. The difference between the old and the improved methods of stopping trains is shown by the facts that, during the experiments made in 1875, on the Great Northern line, near Newark, a train with the ordinary hand-worked brakes, when it was running at about 48 miles an hour, was not stopped until 86 seconds had elapsed, after running nearly 1200 yards, while the same train, at

the same speed, with a vacuum-brake acting continuously on every wheel, was pulled up, in 26 seconds, within 400 yards. A Westinghouse-brake, on the same occasion, stopped a train running at 54 miles an hour, in about 330 yards of distance, and within 23 seconds from the moment of application. In countless cases, accidents have been prevented by the modern brakes. On the North British Railway, to give a single instance, an express train running at 60 miles an hour was brought up by the Westinghouse-brake within nine yards of a train which had broken down and was blocking the line.

During the fifty years that have elapsed since the railway-system in Great Britain was fairly established, most remarkable changes have been brought about in the three main elements of safety, speed, and comfort. As regards safety, it has long been a demonstrated fact that railway-travelling is safer than walking in the streets of a busy town, than riding or driving, than going up and down stairs, and than the act of eating, since more people die every year by choking in England alone than are killed, without their own default, on all the railways of the United Kingdom. In 1882, the chairman of the London and North-Western Railway could truly state that on the whole of the system, more than 1500 miles in length, with all its branches, not a single passenger had been killed during the previous 2½ years, the number of passengers carried having been between 50 and 60 millions in the year. In 1890, throughout the United Kingdom, only 18 passengers were killed, and 496 injured, through causes beyond their own control, *i.e.* by accidents to trains. The passenger-journeys made, exclusive of those of season-ticket holders, were nearly 820 millions, and the proportion of passengers killed, without their own default, was but one in 45½ millions, and of injured, one in 1,650,000. The railways of Great Britain are, in fact, the safest in the world.

The same boast may be truly made concerning the swiftness of our passenger-traffic. The average speed of long-distance trains has risen in 20 years, from 19 to 31 miles, or, if express trains be separately reckoned, to nearly 42 miles. There is nothing like the speed of expresses. A speed of 70 miles an hour is common. Many of the Midland Railway expresses run without a stop from King's Cross to Nottingham, a distance of 124 miles, and the present writer, in September, 1893, timed this as done in 2 hours

18 minutes, being an average speed of 54 miles an hour. The Great Northern, the Great Western, and the London and North-Western expresses daily perform journeys about as remarkable, but not for so long continuous runs. To the north of the Thames, owing to competition for public custom between three great lines, the service of fast trains is unparalleled for number. Ten or more daily expresses run between London and thirty-two important towns. Between the metropolis and Manchester, in 1887, there were 42, to and from Nottingham there were 35, between Leeds and London 28. There were 27 expresses between London and Liverpool, 16 between London and Edinburgh, 12 between London and Glasgow.

A yet more noteworthy change has come, within the last 20 years, for the benefit of the great mass of the people. Many years passed away before the directors of railways recognized the importance of the third-class traveller. In the early times the effort made by railway-managers was, not to render travelling attractive to large numbers, but to force those who must travel to pay highly for it. The third-class passenger was regarded as a nuisance, not as a source of profit. He could claim, by Act of Parliament, to have one train per day, on every line, with carriages of his class travelling at an average speed of 12 miles an hour, including stoppages, and at a charge of 1*d.* per mile. This was the despised "Parliamentary train", a term now wholly abandoned. Everything was done that was likely to drive the pariahs of railway-traffic into second-class carriages, at double fares, or more, of the 1*d.* per mile. They were forced to start, from the terminus-stations, for the lengthy journeys, at early morning. They were often placed in carriages open to the sky, like the cattle-trucks of the present day. They were shunted into sidings to let fast trains go past them, and they were sometimes kept for an hour, or two, or three, at roadside stations. They were snubbed by porters and guards; they travelled in carriages unfurnished with any lights for night-time or for tunnels, and their existence, during the tedious hours of a long railway journey, was in many ways made vexatious and burdensome. In spite of all discouragements, people would and did travel by the third-class trains, and the Companies woke up slowly to the fact that money could be made out of those who, with small means as individuals, owned as a body a large

of the national income. It was the Midland Railway that in 1872 led the way to a revolution in travel for third-class passengers. From April 1st in that notable year, all trains on that extensive system were open to their use, and the managers, two years later, abolished the second-class carriage. From that time, a growing change was seen and felt by the vast majority of railway-travellers. The seats of wood, with straight backs that, after fifty miles, caused aches and pains, began to be covered with some soft material. Then a sloping back, with angle adjusted to the needs of the spinal column, and well-stuffed cushioned seats, gave further relief, and a greater width between the seats removed a fertile source of discomfort and its attendant discourtesy. A greater height afforded purer air, and moveable ventilators provided both for health and comfort. In this age of tobacco, a great boon came when, for every class of travellers, special carriages were set apart for indulgence in the weed, without annoyance to sensitive non-smokers. Meanwhile, the wealthy had their luxurious tastes consulted in the American invention of the Pullman car, and could, on the lengthy journey to the north towards the grouse-moor and the deer-forest, sleep in comfortable berths, and, within the last few years, on certain lines, partake of meals that were cooked "on board". At last, in the early summer of 1893, the third-class traveller reached the height of the recognition due to the majesty of the People in a democratic age. The policy of the most enlightened railway-managers had now become that of not merely giving comfortable transit to those who, with but moderate means, were called by business to necessary travel, or chose to inspect the natural beauties, or the interesting towns, or the historic scenes of their native land, but of enticing them abroad by the allurements of a luxurious ease that made the mere act of speeding through the country a positive delight. The culmination of the third-class traveller's course from discomfort and dirt, delay and detriment to temper, towards treatment worthy of a prince was reached, on the three great railways to the north of the Thames, in the institution of the corridor-car. The traveller to Scotland, for a fare below 1*d.* per mile, found himself installed in a long handsome carriage, with plate glass sides affording a perfect view, with room to walk at ease between the side-lines of seats and tables, furnished with writing and smoking rooms, and with a refreshment bar and

kitchen affording luncheon and tea, and an excellent dinner cooked and served in a style equal to that of a first-class club. Personal trial is the best of testimony, and the present writer cannot, in common gratitude to enterprise and energy and skill, fail to mention a journey from St. Pancras to St. Enoch's Station, Glasgow, when he was in feeble health, and was conveyed, in nine and a half hours of travel, with no sense of fatigue, over a course of nearly 450 miles, completed three minutes before the official advertised time. The secret of this improvement of their lot for third-class travellers lies in the facts, duly noted by railway managers, that, as early as 1858, the receipts from them largely exceeded those from the first-class, and were just above those from the second-class traffic; that in 1870, the third-class money-payments nearly doubled the first-class, and were more than half as much again as those from the second-class; that in 1875, the amount of third-class fares exceeded by one-half those of the first-class and second-class combined; that in 1880, they all but doubled the two put together, and in 1884, were nearly thrice as much as the two combined. In 1892, seven-eighths of the receipts from passenger-traffic on the railways of the United Kingdom came from the pockets of third-class passengers, or, in other words, let the once despised third-class travellers cease to take tickets, and the railway-companies would not only have no dividends to pay, but would have, perforce, to close their station doors. The history of modern times affords no more striking example of the benefits of free trade and competition. The magnificent, the almost miraculous, results of railway-enterprise are due to no government control, no subsidy or aid or interference from the State, but to the natural development, in a free country, of the use of capital seeking, through energy and skill, a commercial profit on invested wealth.

Leaving tunnels aside for separate treatment, we turn to some great works in British engineering achieved upon our railway lines. In stone, and brick, and wood, and iron, and steel, some of the viaducts and bridges are stupendous and unrivalled examples of human labour and scientific knowledge. The brick bridge over the Thames at Maidenhead, on the Great Western Railway, is a good example of the younger Brunel's audacious engineering. There are two main arches, elliptical in shape, with a rise of but 24 feet, and each having 128 feet span. A grand structure is the Balloch-

... Glasgow and South-Western line, across the ... at a height of ... feet above the water-... with ... feet width at each ... the largest span of rail-... the ... in the south-... structure, remarkable for a length ... height ... above the bottom of ... North Pembroke in the Man-... made ... and are composed of timber, ... Chirk, in ... and ... finish, ... each ... north-west ... across ... The ... colour, and the whole structure is ... resting upon massive iron ... through layers of silt peat, ... feet wide, and for the ... the railway-bridge is moved ... mid-river pier One ... surrounded by scenery of impres-... viaduct, on the Midland Railway, ... At this point the line, having just ... passes of Ingleborough and Penyghent, ... mountain rising to nearly 2500 feet ... seems to block the road when the railway, ... the right, crosses a gorge upon a viaduct of ... which is 105 feet in height. Among ... railway-lines, the finest example is the ... bridge across the Tyne, between Newcastle ... The river there flows through a great ravine, ... steam-hammer was used to drive piles of ... into the river-bed, to form cofferdams and so secure ... foundation for the piers. After months of contest with the ... a quicksand-bed, it was needful to lay a foundation of ... concrete, on which piers of 131 feet in total height were ... more than 100 feet above high-water mark. On ... feet thick, composed of masonry, six cast-iron arches,

each of 125 feet span, were laid, and these arches, by an unique arrangement, support a double roadway. Above them run the lines for railway-traffic, and, 22 feet below, is the road for carriages and foot-passengers. This grand structure, designed by Robert Stephenson, and containing nearly 5000 tons of cast-iron, with over 300 tons of wrought-iron for the tie-rods, was opened by Queen Victoria in 1849.

Space fails for telling the tenth part of the engineering wonders to be seen on railways, and we must conclude with a brief description of three of the most remarkable structures of this class to be found in the world. Our first example of a great wrought-iron viaduct was the Britannia Bridge across the Menai Strait, on the line from Chester to Holyhead. The river Conway, on the same route, had by May 1848 been crossed by two rectangular tubes or tunnels of wrought-iron, placed side by side, each with a span of 400 feet. The designer and builder, Robert Stephenson, had been greatly aided by the experiments and researches of Sir William Fairbairn, in testing by models, on a large scale, the strength of the material in tubes of divers shapes. The Britannia Bridge was the Conway structure in a far larger form. Two independent tubes, each containing 4680 tons of wrought iron, in their 1510 feet of length, are fixed through three towers of masonry at a height of 100 feet above high-water. The bridge has four spans, two of 460 feet each over the water, and two, each of half that width, above the land. The four central portions of tube (placed two together, side by side) each weighing 1800 tons, were lifted into position, up through over 100 feet, from huge pontoons on the water below, the moving power being hydraulic, exerted by a Bramah press, with two iron chains of 100 tons. On March 5th, 1850, the bridge was opened by the passage of three powerful engines, which stopped in the centre of each of the great spans, without causing the least undue deflection. A train of wagons, with a total weight of 300 tons, was then drawn slowly through. Finally, a train of 200 tons weight was left standing for two hours in one of the tubes, and a train of 3 engines, 200 tons of coal, and over 30 railway-carriages, with over 600 passengers, passed through at a speed of 35 miles an hour. For forty-five years this marvel of engineering power and skill has been doing its work without the slightest failure or mishap.

The Saltash Bridge, opened by the Prince Consort in 1859, and thence called the Royal Albert Viaduct or Bridge, is one of the finest works of its class. This great structure, designed by Brunel, the engineer of the Great Western Railway, conveys that line across the river Tamar, from Devonshire to Cornwall, at a point 4½ miles north-west of Plymouth. Made of wrought and cast iron, with the roadway supported by suspension-chains attached to the land-piers on each side and to two great arched tubes above the roadway, the bridge crosses the water-way, at a height of 102 feet above high-water mark, in two spans each above 600 feet in length. In the centre of the river is a great pier composed of four cast-iron columns, larger than had ever yet been made. Octagon in shape, each is 10 feet in diameter, and 100 feet in height, with a weight of 150 tons. The support of these columns lies in an immense cylinder of wrought iron, 37 feet in diameter, 100 feet high, and weighing 300 tons, sunk through 70 feet depth of water and 20 feet more of mud and gravel, until it rested on the solid rock as the ultimate foundation of the whole gigantic work. The interior of this cylinder was then filled with solid granite. The whole bridge is 2240 feet in length.

All structures for the passage of railway-lines across gorges and ravines, rivers and estuaries, have been surpassed by that latest wonder of the world, the Forth Bridge, crossing the Firth of Forth from Queensferry, in Linlithgowshire, to Inverkeithing, in Fifeshire. This stupendous work, on the North British Railway, occupied seven years, from 1883 to 1890, in erection, and is remarkable for the application, on an enormous scale, of a novel principle in bridge-building, that of the cantilever (cantaliver) or bracket, in which two pieces of engineering-work, projecting from fixed bases towards each other, are locked together by a connecting piece, in this case composed of 350 feet of girders made of Siemens steel. The island of Inchgarvie, about midway across, gave support for a great central pier, but, as the water in the two channels, between the island and the mainland, was 200 feet deep, no artificial piers, built up from the bottom, could be made, and the channels are therefore crossed by two main spans of steel, each of 1700 feet in length. Two other spans, crossed by the shore-ends of the outer cantilevers, are each 675 feet wide, and beyond these again, reaching to the shores and carried for some distance over the land,

are 15 rectilineal spans of 168 feet each. The space spanned by the cantilevers is 1 mile, and the whole length of the viaduct, including the piers, exceeds 1½ miles. The railway runs at a height of 152 feet above high-water mark, and from the water-way to the top of the steel-work, at the highest part of the bridge, there is a distance of 360 feet. The piers contain about 120,000 cubic yards of concrete and granite, and the superstructure is composed of about 45,000 tons of steel. The engineers who designed and carried out this Titanic undertaking, which cost nearly two millions sterling, were Sir John Fowler and Sir Benjamin Baker. It was opened on March 4th, 1890, with a ceremony in which the Prince of Wales took the leading part.

We have no space left for dealing in detail with the enormous cuttings, through earth and through rock of various kinds, which are to be seen on many of our lines of railway, and can only state generally that there have been single operations of this kind that have involved the removal of one million cubic yards of earth and rock, much of it limestone as hard as flint, with a consumption of 3000 barrels of gunpowder for blasting, during the work of 800 men for over two years, at a total cost of a quarter of a million sterling; and that there has been an instance of a landslip in a railway-cutting, on the North British line near Dunfermline, in which 8000 tons of sand and rock came down upon the line, and blocked it for five days. Before passing on to the subject of tunnels, we may give some idea of what the railway-system means in commercial and national importance by the statements that on the lines now working in the British Isles, with a length of over 20,000 miles, nearly 400,000 persons are employed, and about 850 millions of passengers are annually carried; that the capital sunk on railway-construction and railway-stock amounts to nearly one thousand millions sterling; that the total annual receipts, for passengers and goods, exceed 80 millions, of which nearly half represents net profit.

The making of tunnels, on a very large scale, belongs almost entirely to the 19th century. Some long tunnelling was effected on canals in this country in the last half of the 18th century, but the greatest works of this class have been those executed on lines of railway. The chief methods employed have been the sinking of vertical shafts at different points in order to ascertain the

of the material to be excavated, followed by the digging out of material in opposite directions, and the formation of a passage which, in the case of clay, or loose earth, or soft, friable rock, is lined throughout with brickwork. In dealing with hills and mountains, where no vertical shaft can be sunk to the intended line of the tunnel, excavation is begun at both ends, and in recent times, the use of gunpowder and other explosives for blasting has been aided by the previous work of improved boring and drilling tools in machinery driven by compressed air. We take, as examples of the toil and cost involved in the making of these subterraneous passage-ways for railway-trains, two tunnels which are far from being the longest in this country. The Box Tunnel, on the Great Western main line, between Chippenham and Bath, is about 3200 yards, or more than 1¾ miles, in length. One part of it lies 400 feet below the surface of the hill through which it passes, and thirteen shafts were needed for the work of excavation and for ventilation. Above 400,000 cubic yards of material were dug out, and 54,000 cubic yards of brickwork and masonry were put in, the number of bricks used being about thirty millions. For 2½ years a ton of gunpowder and a ton of candles were consumed every week in blasting and in affording light for the labour of 1100 men and 250 horses. Water came in so freely, at one point of the work, from fissures in the freestone rock, that it was pumped out by powerful steam-engines, at the rate of 32,000 hogsheads per day. The Kilsby Tunnel, on the London and North-Western main line, as the traveller from London draws near to Rugby, was a work of enormous difficulty and cost. The testing by trial-shafts had shown the hill to be mainly composed of oolite shale, a material not difficult to deal with, and a contractor undertook to make the tunnel, 1⅓ miles long, for the sum of £99,000. A sore deception was below the surface, between the trial-shafts. Beneath a bed of clay, 40 feet in thickness, lay a quicksand from which burst forth a flood of water that made the workmen run, and, in some cases, swim for their lives. For eight months, water was pumped out at the rate of 1800 gallons per minute, a quantity about equal to that in the Thames, at high-water, between London Bridge and Woolwich. The gunpowder used for blasting, during the whole work, amounted to nearly 160 tons, and the bricks used in lining the tunnel were 36 millions, enough to make a footpath a

yard wide from London to Aberdeen. The hapless contractor was relieved by the Company from his obligation as to cost, but he was completely broken down in health by the vexatious trouble of the work, and died in a short time. The cost of the Kilsby Tunnel, in the end, reached nearly £300,000, thrice the original estimate.

The Underground Railway in London, however, is probably the best proof of the difficulties grappled with, and triumphantly subdued, by the consummate courage and skill of modern British engineering, which displays, in truth, our inborn qualities of race in a manner of which we may be as justly proud as of any achievements in other fields. Below the surface, in the greatest city, by far, that the world ever contained, lay obstacles more numerous and more delicate than countless tons of soil to be removed, or rivers of water to be pumped away by steam. The work was not one for the application of explosive forces or of steam-pumping, but of nice calculation, deft handling, and cautious progress from point to point amid a labyrinth of hindrances, the rough treatment of which would have caused damage to property, and peril to life, at every step. The bed of London thoroughfares, like the human frame, is full of arteries and veins, in the shape of pipes for water and for gas, for sewage and for telegraphic-wires. The most careful removal, in some cases, of these channels of communication and exit and supply, to another course, and the most provident groping for a passage to the lines of railway, were the chief points of difficulty for the contractors and their men, along with the need to lend the new support of underpinning, at many points, to the heavier buildings above the route taken by the railway. The whole system of the Inner Circle and District Railways in London came into existence, at enormous cost, between 1863 and 1885. The price of land needing to be purchased for the work was the cause of the Inner Circle line, the most expensive in the world, needing an outlay of from £600,000 to nearly one million per mile. The longest railway-tunnels in the British Isles are the Dore and Padley, in the north of Derbyshire, which has a length of 6200 yards, or above 3½ miles; the Standedge, on the London and North-Western, through a range of hills dividing Yorkshire and Lancashire, with a length of 3 miles, 150 yards; and the Woodhead Tunnel, in north Derbyshire, which just exceeds three miles.

There are also some remarkable instances of subaqueous tunnels, pierced below the beds of rivers. The first of these, in point of time, was the passage-way driven beneath the Thames, from Rotherhithe to Wapping, with the view of affording a means of communication between the north-eastern and south-eastern parts of London. This work, known as the Thames Tunnel, was designed by Sir Marc Isambard (the elder) Brunel, and executed with the aid of his distinguished son, whom we have seen in connection with the Great Western Railway, and the *Great Western*, *Great Britain*, and *Great Eastern* steamships. It was a work then of great difficulty, begun in 1825, and long delayed, after 300 yards, or $^{6}/_{7}$ths of the distance, had been bored, by the occurrence of quicksands, and the consequent influx of water. It was not completed until 1843, at a cost approaching half a million, for which there was no return in the shape of commercial success. It remained, for thirty years, a mere curiosity, visited by the public for a small payment. In 1876, it was at last turned to account as a railway-tunnel, conveying the East London line beneath the river, and thus connecting some of the lines south of the Thames with the Metropolitan Underground system. About the same time, the Tower Subway, for foot-passengers alone, was made beneath the Thames not far below London Bridge, and in 1890 two separate tunnels, made more than 50 feet below the bed of the river, came into use for the City and South London electric railway. Each of these consists of a cast-iron tube, 10 feet in diameter, and composed of segments bolted together. A still greater work than these was the Mersey Tunnel, opened in 1886, and connecting Liverpool and Birkenhead by a railway of great service in joining the Lancashire and Cheshire lines. With the approaches, this important tunnel exceeds 3 miles in length, and runs about 30 feet below the river-bed. Ventilation is obtained by means of large fans and of a small tunnel that runs alongside, the cost of the whole work having much exceeded a million sterling. On a still larger scale is the grand engineering feat known as the Severn Tunnel. A glance at the map shows that the route of the Great Western Railway, from London to South Wales, by way of Gloucester, involves a great round. A saving of forty miles was possible by a tunnel beneath the estuary of the Severn, from New Passage, in Gloucestershire, to the opposite point on the Mon-

mouthshire shore. In 1872 an Act for this purpose was obtained, and seven years of toil and trouble were expended by the engineer, Mr. Richardson, in driving through a "heading", or preliminary passage. The width of the river itself exceeds 2¼ miles, but the tunnel, with the approaches, is 4½ miles long, and 3 miles more must be added to the undertaking for the open cuttings leading to the tunnel. 60 millions of bricks, laid in Portland cement, line this gigantic passage, 24½ feet in height, and 26 feet wide, for a double line of rails. From October, 1879, to February, 1881, the works were stopped by an influx of water that flooded the whole excavation, and seemed, in a few hours, to have reduced to naught the labours of seven years. Sir John Hawkshaw, the eminent engineer, was called in, and, under his advice, the use of huge brick dams checked the inflow from the subterranean water-course that had done the mischief, and the works were cleared by pumping-engines of enormous power. Feats of great heroism and endurance in the divers who were employed distinguished the work of clearance, and the whole piece of engineering was completed in 1885.

We pass from tunnels to canals, and note that the work of these useful water-ways was not altogether superseded by the railway-lines. Many of them fell into the hands of the new companies, and the last ordinary inland canal was finished in 1834. There are, however, still some that compete with the iron road for the carriage of heavy goods. Among these are the Aire and Calder, in the south of Yorkshire, which is 9 feet in depth, and admits of steam-towage with a train of barges; the Weaver Navigation, in Cheshire; and the Gloucester and Berkeley Canal, with a depth of 15 feet, by which vessels of 600 tons can go from Sharpness, on the Severn, to Gloucester, a distance of 17 miles. In Scotland, the Forth and Clyde Canal, 10 feet deep, and 35 miles long, from Grangemouth, on the Forth, to Bowling, on the Clyde, was completed in 1790, and the Union Canal, joining it near Falkirk, continues the water-way, for vessels of moderate burden, to Edinburgh. The Crinan and the Caledonian Canals are widely famed, through the tourists who, for many years, have passed each season in thousands along their waters, on their journeyings amidst the noble scenery of the Western Highlands and Isles. The Crinan Canal, planned by the elder John Rennie, was opened, as we have seen, in July, 1801. There

were serious accidents to the embankments in 1805 and 1811, and the work was not finished until 1817, with grants of public money expended under the direction of Telford. There are 15 locks in the 9 miles of the canal, which is 10 feet deep and 24 broad, giving passage to vessels of 200 tons. In 1859, a cost of £12,000 was incurred through the bursting of the three reservoirs which supply the water. The Caledonian Canal, with the lakes which it connects, cuts Scotland in two from south-west, at the head of Loch Linnhe, to north-east at Inverness. A saving of 250 miles, between the Atlantic and the North Sea, is thus effected, and sailing-coasters are spared the dangerous navigation round by the outer Hebrides and Pentland Firth. It was James Watt who first, in 1773, showed that the work could be done; it was Telford who began it in 1803. The water-way, of which but 23 miles are artificial cuts, 120 feet in width at the top, 50 feet broad at the bottom, and 17 deep, was opened for traffic in 1823, and affords room for vessels of nearly 600 tons, the whole cost, including three years of repair, from 1844 to 1847, exceeding one million three hundred thousand pounds. The natural lakes or lochs on this route, through Glenmore, or the Great Glen, in Inverness-shire, going from south to north, with a total length of about 37 miles, are Lochs Lochy, Oich, and Ness, displaying scenery of romantic beauty and grandeur.

The nineteenth century has been, in its later times, the age of canals on the largest scale, for the passage of ships with a burden of several thousand tons. The Suez Canal, completed in 1869, is an example of conspicuous utility and success; the Panama Canal, begun by the same French engineer, de Lesseps, in 1882, proved to be the greatest engineering failure on record, involving the loss of at least sixty millions sterling. The Amsterdam and the North Holland Canals, constructed since 1870, are instances of successful cuttings for large vessels, and the year 1893 saw the completion of another ship-canal, about 4 miles long, begun in 1882, through the world-famed, classical Isthmus of Corinth. In this last decade of the great engineering century, we have, in Great Britain, completed a grand specimen of these artificial passages for shipping of great size. The Manchester Ship Canal was opened for traffic early in 1894, at a cost, since its commencement in the autumn of 1887, of about fourteen millions of pounds. Running for nearly 36 miles from Eastham, in Cheshire, on the Mersey above Liver-

pool, to Manchester, this enormous excavation, with a water-depth of 26 feet, has nearly twice the width of the Suez Canal, and allows steamers of the largest size to pass each other. The entrance from the Mersey is deep enough to allow ships of the largest tonnage to pass into or out of the canal at all states of the tide, and the upper reach, near and at Manchester and Salford, contains docks that cover 104 acres, besides quays extending over 150 acres. Compared with this magnificent work, the Suez Canal, in its construction, is a mere ditch. The five series of locks are the strongest and largest in the world. The railway-lines and roads met with on the route are carried over the ship-canal by swing or high-level bridges, and the Bridgewater Canal has a swing aqueduct for itself, a novel and ingenious piece of work weighing 1400 tons. Manchester has thus become a seaport of the first class, and the greatest manufacturing population, for its dwelling-area of above 700 square miles, in the whole world, averaging about 5500 persons to the square mile, is presented with unrivalled facilities for the cheap receipt of raw material, and for the easy despatch of the goods which are fabricated therefrom. The digging out of the earth in making this stupendous water-way was vastly facilitated by an invention of these later days. The steam-navvy or steam-excavator, clearing away, in its largest size, two cubic yards of earth per minute, and working, in its two forms, ahead for extending length, and sideways for width, is a real prodigy of efficiency and power, doing on dry land, and with similar mechanism, the same task as a dredger at the bottom of harbours and estuaries. When the material has been scooped up into the row of buckets, a species of crane swings them round and empties their contents into the wagons placed on rails above. Each of these machines performs the work of 70 or 80 men.

Passing over, perforce, the labour-saving inventions known as machine-tools, marvels of accuracy and ingenuity for drilling, punching, boring, planing, sawing, and other operations once solely performed by human hands, we note an appliance introduced about 1860, the traction-engine for drawing heavy loads along ordinary roads, and the steam-rollers used for finishing highways. The diving-bell and diving-dress have been largely used of late years both for engineering-work under water, and for the examination of submerged vessels, with a view either to the recovery of the

contents, or to preparations for raising the sunken craft. This latter work is entirely modern. The Thames Conservancy Board, between 1880 and 1892, raised from the river-bed nearly 400 vessels, of which about three-fourths were barges. After cables have been fastened by divers round the hull, the ropes are attached, at low water, to lighters, and the floating power of the rising tide brings the vessel to the surface of the water. It is only in certain depths that this can be effected. In the catastrophes that befell the *Vanguard* and the *Victoria*, and other great ships, both their own weight, and the depth of water for divers, made raising impossible. The *Eurydice*, however, off the Isle of Wight, and the *Sultan*, in Maltese waters, and the *Howe*, in Ferrol harbour, on the north-west coast of Spain, have thus been recovered, and two fine iron-clads, in the *Sultan* and the *Howe*, were restored to the royal navy. During the eighteenth century, diving-bells, of which the principle had long been known, were sometimes used, and Smeaton constructed one, of the present form, in 1788, for work at Ramsgate. Improvements have been made, and the workmen are well supplied with air by pumping. The open helmet diving-dress, in various forms, is a German invention, with tubes both for the supply of fresh and for the escape of vitiated air; and every vessel of importance in our navy carries at least one apparatus and diver.

Our last topic in connection with modern engineering is that of aeronautics. Air-navigation dates only from the later years of the eighteenth century, when the French brothers Montgolfier succeeded in causing bags to ascend with air rarefied by heat, and another French experimenter, Professor Charles, sent up a balloon inflated with hydrogen gas. The first ascent ever made with a car containing human beings was at Paris, on November 21st, 1783, when Pilâtre des Rosiers and the Marquis d'Arlands, in a huge Montgolfière, or heated-air balloon, passed over the Seine and safely descended. A few days later, Messieurs Charles and Robert, in a hydrogen balloon made of sewn silk, varnished with caoutchouc, ascended from the Tuileries gardens, in Paris, and made a voyage of 27 miles. This balloon, covered with a net supporting the car, and furnished with a valve for letting out the gas, and with sand-ballast, was practically the same machine as has continued in use until the present day. In August, 1784, Mr. J. Tytler, at Edinburgh, made the first ascent in the British Isles, and in January, 1785, Mr.

J. P. Blanchard, along with an American gentleman, Dr. Jeffries, crossed the Channel from Dover to Calais. Hydrogen was superseded by coal-gas, with which agent the famous English aeronaut, Green, and two companions, in 1836, made 500 miles, from London to Weilburg, in the German state of Nassau, in eighteen hours. In 1862, Mr. Glaisher and Mr. Coxwell made their renowned ascent from Wolverhampton, reaching a height of 7 miles, the greatest on record, and both becoming almost insensible from rarefaction of the air and from cold. The descent could only be made when Coxwell, mounting into the ring above the car, found his hands stiff with cold, and opened the valve by seizing the line between his teeth. Apart from some meteorological observations, the balloon has been hitherto, save in one notable siege, little more than a toy, making ascents for popular amusement, with the excitement increased by the descent of a performer in a parachute, or umbrella-like device for retarding velocity. Some slight use has been made of balloons for observation of hostile movements in war, and during the siege of Paris, from September 19th, 1870, to January 28th, 1871, for the first and only time in the history of aeronautics, balloons became of really great and serious service to mankind. Over sixty persons, including Gambetta, the inspirer and civil leader of the national resistance to the Germans, after the collapse of the imperial forces, were enabled to leave Paris for the provinces, descending at points beyond the German sphere of conquest and occupation; and a regular balloon-post took out nearly 2½ millions of letters and post-cards, with information to the French government concerning affairs in the city, and with tidings of beleaguered persons for their relatives and friends in the French provinces or abroad.

CHAPTER VIII.

POSTAL SERVICE, TELEGRAPHS, TELEPHONES.

Postal charges in former times—"Franking" of letters—Rowland Hill—Agitation for cheaper postage—The penny post established—Opposition of officials to Hill's scheme—The book-post, packet-service, and money-order— Statistics of the reformed post-office—Post-cards, the parcel-post, and postal orders—Cheapening of foreign postage—Envelopes and steel pens—The electric telegraph—Sir Charles Wheatstone and Sir William F. Cooke—Submarine telegraphy—Lord Kelvin—Ocean cables. The telephone, photophone, and phonograph.

Few fiscal changes have been fraught with more good to the best interests of the human race than the reduction of charges for the conveyance of written communications. The outer world of commerce, and the inner world of domestic affection and of friendly feeling, have alike received therefrom incalculable benefits, not to be measured, in the latter instances, by any pecuniary standard. In the days before penny-postage, or prior to 1840, members of both Houses of Parliament, and many official personages, who had the privilege of "franking" ten letters daily, *i.e.* of sending them duty-free by their signature on the envelope or the outer corner of a folded sheet, were perpetually pestered by their friends for this sparing of expense. Men of business were subjected to a heavy tax; people of moderate means could only afford rare letters to their relatives and friends, the poor could never send letters at all, save by the rare chance of an acquaintance going in the needful direction, or of some surreptitious means of carriage. Up to 1840, it cost 10*d.* to send an ordinary letter, under one ounce in weight, for a distance up to 170 miles, 1*s.* up to 300, and 1*d.* for every additional 100 miles. Up to 15 miles, the charge was 4*d.*, and this was the lowest for any place outside London, if the letter were sent from within the metropolis. An enormous amount of smuggling of letters by carriers was practised, and the revenue was defrauded in signals made with ink on newspapers by dots and other devices. When members of families in the working class were once parted from home, a separation almost like that of death ensued for hundreds of thousands going forth into the world as shopmen, apprentices, domestic servants, and workmen in handicrafts of every kind. No human imagination can compass the moral mischief, the cruelty, of the barriers between parent and

child, brother and sister, husband and wife, lover and sweetheart, friend and friend, thus existing in those "good old times" which privilege and power, and vested interest in wrong, did their utmost to maintain as a state of ideal perfection for mankind. The hero of the struggle that brought reform was Rowland Hill. This eminent man, one of the ablest and most faithful public servants that Great Britain ever possessed, was born at Kidderminster, in Worcestershire, in 1795, son of a man who, though he failed in business owing to the great war with France, was possessed of great intelligence, with an upright, bold, and simple-hearted character. The elder Hill was one of those who raised their voices against slavery and the slave-trade, and the cruel severity of our criminal code, and was also an early and unswerving advocate of full religious liberty and of free trade. From his father Rowland Hill derived largeness of view and boldness of conception; an admirable mother gave him shrewd common sense, firmness of purpose, prudence, caution, and patience in working out his strong desire to improve the world, and to do, before he died, something for the signal advantage of mankind. He belonged to a class of great Englishmen who, with no special training of a professional kind, and with little or no ordinary education, have suddenly shown themselves able to play a great part in the affairs of the world. Of such was Clive, who went out as a mercantile clerk to India, and became a great soldier and a great ruler. Of such was George Stephenson, who was brought up in a colliery, and gave us our railways. Up to the age of thirty-seven, Rowland Hill was a schoolmaster, and he then reformed the postal system of the world. He had been trained at home to care nothing for mere authority, but to rely for his conclusions in human affairs upon reason, inquiry, and argument alone. In his home-days of honourable poverty and hard work, he had known his mother dread the postman's visit, as she had not money in the house to pay the postage. After playing an active part in the front rank of the men of Birmingham during the agitation for the Reform Bill that became law in 1832, and assisting in the foundation of the Society for the Diffusion of Useful Knowledge, Hill was, for four years, the able secretary to a Commission for colonizing South Australia. He then turned his attention to postal reform, at a time when, in the 11,000 parishes of England and Wales, there were but 3000 post-offices, and the

postal revenue had remained stationary for twenty years. In Hill's mind, a tax was already self-condemned if its productiveness did not keep pace with the growing numbers and prosperity of the nation. He had never been inside a post-office, and he now set himself to investigate, from the outside, with Blue Books and other apparatus, the whole postal system. By degrees, uniformity, as well as reduction, of rate for letters up to a certain weight, came within his mental view. He found that the actual cost of carrying an ordinary letter from London to Edinburgh was but 1/36th part of a penny. This was enough. Let this fact be known, and the monstrous overcharge was doomed by public opinion. It was in the year of Queen Victoria's accession that Rowland Hill's plan was published in a pamphlet entitled *Post-office Reforms*. It had been found that the penny-posts established in towns answered well, but the public were startled when Hill proposed that all letters not exceeding half an ounce in weight should be conveyed, for a penny, to any distance. The authorities at St. Martin's-le-Grand, in London, of course treated the project with utter scorn, but, in the public mind, amazement soon gave way to interest and welcome, and Parliament was besieged with petitions. The public press, a power in the land, was strong in support. Inside the House of Commons, the plan for cheap and uniform postage, prepaid by stamps, according to Hill's proposal, was eagerly taken up by Mr. Robert Wallace, M.P. for Greenock, whose casting vote, as the Chairman of a Select Committee, alone carried the plan of uniform postage, while a two-penny, instead of a penny, rate was recommended. Daniel O'Connell, one of a deputation including 150 members of Parliament that waited upon Lord Melbourne, the Premier, in May, 1838, put the sentimental side of the case in strong and eloquent terms. "Consider, my Lord, that a letter to Ireland and the answer back would cost thousands upon thousands of my poor and affectionate countrymen considerably more than a fifth of their week's wages. They are too poor to find out secondary conveyances, and if you shut the Post-office to them, as you do now, you shut out warm hearts and generous affections from home, kindred, and friends." Against strong official and Parliamentary opposition penny-postage was carried at last, and on January 10th, 1840, it came into force, prepaid, for every packet up to half an ounce, with an additional penny up to one ounce, and

twopence for every ounce or part of an ounce beyond. In the following May, stamped envelopes, and the adhesive stamps which soon became almost the sole means of prepayment, were issued. The plan was not, however, fairly tried, as regarded any advantage to the revenue, for some years after this. The most determined and vexatious obstruction to Hill's general plans of reform was made by the permanent officials of the Post-office, which needed a thorough and radical reorganization. He was appointed, for two years only, at a salary of £1500 a-year, to carry out his scheme, as best he could, from the Treasury, instead of at the Post-office, and induce the consent of officials at St. Martin's-le-Grand, who were convinced that his plans must fail, and were resolved that they should fail. In 1841, under a new government, he was dismissed from the public service, but the nation took up the matter with indignant sympathy, and presented Hill, at a public dinner, with a cheque for £13,000. In 1846, with a change of ministry, he was made Secretary to the Postmaster-general, and at last, in 1854, he had full power, of which he made excellent use, to reorganize the postal system, on his own principles, as Secretary to the Post-office. In 1860, Hill became Sir Rowland, as a K.C.B., and in 1864, when ill-health compelled his retirement, he was most fitly awarded a Parliamentary grant of £20,000, with a pension of £2000 a-year for life. Besides a host of minor improvements, in addition to the grand reform, he had established the book-post, reformed the packet-service, and rearranged the useful money-order system started in 1838. The growth of railways had been a main element of success in rapidity and regularity of service, and a later improvement was the adoption of postal-carriages on railways, fitted with the apparatus for receiving and delivering letter-bags on the way without stoppage of the train, and furnished with facilities and a staff of clerks for sorting letters and packages during transit. It was in 1852 that the gross revenue, on the new system, after diminution, recovered the point of the highest amount that was yielded on the old, and then, with rapid strides, it reached the present position of furnishing a net annual revenue, or clear profit, of about three and a half millions sterling. Sir Rowland Hill, after receiving the honours of F.R.S., of D.C.L. from Oxford University, and of the freedom of the City of London, died at Hampstead, in London, in 1879, and was buried, among many

illustrious dead, but with none who was a greater benefactor of mankind, within the walls of Westminster Abbey. We may here state, as some measure of the debt of gratitude due to the founder of cheap postage, that, whereas in 1839 the number of letters passing through the Post-office was 82½ millions, in 1840 this number had more than doubled, and in 1896 the delivery of letters had increased to over 1800 millions, besides over 300 millions of post-cards, nearly 700 millions of book-packets and circulars, and about 150 millions of newspapers. In 1871, a further boon came in the raising of the weight of a letter, carried for 1*d.*, to one ounce; 1½*d.* for 2 ozs.; 4 ounces for 2*d.*, and, since 1885, ½*d.* for every additional 2 ozs. beyond 12. The halfpenny post-cards were introduced in October, 1870, and at the same time the penny-postage on newspapers was reduced to half the amount. The services rendered by the Post-office department in the encouragement of thrift have been already described. Mr. Fawcett, who became Postmaster-general in 1880, reformed the money-order system by reducing the charge for orders, and giving additional facilities for their currency, and it was he who established the parcel-post, a great boon to the mercantile community, and introduced other useful reforms, especially in the telegraphic service. The "postal orders" for fixed sums, forming a kind of small currency, were introduced in 1881, under Mr. Fawcett's management. Up to 1875, the postage of letters to foreign countries and British colonies was very burdensome to the commercial class, and to those who had relatives and friends living abroad. Then the International Postal Union, by a treaty concluded at Berne in 1874, came into operation, and by subsequent extensions, letters up to ½ oz. in weight can be sent for 2½*d.* to any part of the world. There are now also a money-order system for foreign parts, and a foreign and colonial parcel-post at reasonable rates of payment. The use of the money-order system, inland and foreign, is such that the amount thus annually transmitted exceeds 45 millions sterling. Registration of letters, for additional security, which is, in fact, an almost absolute guarantee of safe receipt, and insurance for letters and parcels, are among the public benefits supplied by the modern Post-office in the British Isles, which is now a triumph of organization unequalled in the world for safety, punctuality, and speed. It is to be noted that the use of envelopes, and the general

adoption of a new implement for writing, came almost at the same time as the introduction of cheap postage. Prior to that great reform, letters were generally written on large sheets of paper folded into envelope-shape and sealed with wax. The stamped envelopes issued by the Post Office were little used, and unstamped envelopes, fastened by gum placed on the flap, by degrees acquired an enormous sale. The use of ingenious apparatus driven by steam now folds and gums the paper with such rapidity that a single machine turns out envelopes at the rate of 90 per minute, and the extent of the trade may be estimated in some degree by the fact that a single Scottish firm, Messrs. Pirie of Aberdeen, were some years ago producing above thirteen millions per week. That great boon to mankind, the metallic pen, was known in ancient times, as nibbed bronze specimens have been discovered at Pompeii and Herculaneum. We hear of steel pens made at Birmingham towards the close of the eighteenth century, and in 1815 barrel-pens of that metal were sold at 18*s.* per dozen. The general use of the steel pen was due, in this country, to Mr. James Perry who, first at Manchester in 1819, and then in London, had a large trade in the hand-made article. The great development of the business came with the machinery used by Mitchell, and by Gillott, and by Sir Josiah Mason, three makers at Birmingham, the town which is still the chief seat of the steel-pen manufacture for the whole civilized world. The progress of the trade may be thus indicated, that, whereas, in 1839, steel pens were, in comparison with the present use, almost unknown, ten years later the making had become a leading industry in Birmingham, with employment for 2000 men, women, and girls, and an output of 65,000 gross, or nearly 9½ millions of pens per week. This prodigious production increased in later years to a weekly average of about 160,000 gross, or 22 millions.

The electric telegraph, as a practical agency for the transmission of news, is almost coincident with the duration of Victoria's reign. Amidst all the disputes as to priority of invention, we may safely assign the practical inauguration of telegraphy, on this side of the Atlantic, to Sir Charles Wheatstone and Sir William Fothergill Cooke, who in July, 1837, more than thirty years before they were knighted for their achievements, took out a patent for the system which was afterwards introduced on the railway-lines. Wheatstone, born near Gloucester in 1802, became, in 1834, Professor of Ex-

perimental Philosophy at King's College, London. In February, 1837, he made the acquaintance of Mr. Cooke, a native of Ealing, near London, who had studied electricity in Germany. They joined their intellectual forces in a commercial partnership, and the first line of electric-telegraph actually laid for public purposes was on the Blackwall Railway, in London, in 1838. Their respective contributions to the grand result were mainly these, that Wheatstone's profound and successful researches had demonstrated the practical use of the invention, and that Cooke introduced and carried it out as a commercial enterprise, promising to become one of national importance. It was some years before the invention took the public fancy, but its value and importance were fully recognized in course of time, and various ingenious persons developed the new instrumentality for the swift conveyance of thought into the wonderful agency which it has since become. By the telegraph, the news of the whole civilized world is laid before us daily in the columns of the newspapers, and technical alterations have effected so much that, as a specimen of speed in the transmission of matter, we may refer to the fact that, at the opening of the debate on Home Rule for Ireland, at the House of Commons, in 1893, nearly a million words—equal to about five hundred columns of leading articles in the London "daily"—were telegraphed from the House, all over the country, to various newspapers, in the course of that afternoon and evening. The telegraph-lines of the United Kingdom, which were previously in the hands of the railway companies and several competing telegraph companies, were in 1870 acquired, through purchase, by the Post-office department, and in 1885 the charge for a telegram, within the kingdom, was reduced to 6*d.* for twelve words, including addresses. In 1895, nearly 72 millions of messages were despatched from about 9600 offices over about 200,000 miles of wire, in the United Kingdom.

Submarine telegraphy, a development very striking to the ordinary imagination, began between Dover and Calais in 1851. The great inventor and improver in this department was that brilliant natural philosopher, one of the foremost in the nineteenth century, Sir William Thomson, now become Lord Kelvin. The honour of his early intellectual prowess belongs to the University of Cambridge, where he was 2nd wrangler and 1st Smith's Prize-

AT WORK IN A TELEPHONE ROOM.

It was about the year 1860 that several men of science found by experiment that they could send sound-vibrations through a wire by means of electricity. To Professor Graham Bell, however, belongs the credit of contriving, in 1876, an apparatus which, by means of an undulating current, could reproduce conversation at a distance. This was patented in the United States and formed the basis of the intricate combination of transmitter, receiver, and other subsidiary appliances known as the telephone, and which is at present in use throughout the civilized world. Telephone exchanges exist in all our principal towns, and by means of this instrument people who are 1000 miles apart can now speak freely to each other. In the illustration is given a view of a switch-room in the offices of the National Telephone Company. This Company has established communication between all the more important towns in the United Kingdom, and transmits over its lines about 416,000,000 messages in a year.



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man in 1845, being already highly distinguished for originality of thought. Born at Belfast in 1824, he became, at 22 years of age, by an almost unparalleled precocity of mental development and swiftness of recognition for merit, Professor of Natural Philosophy in the University of Glasgow. To him, far beyond all other men, is due the commercial success of the lengthy submarine cables, for the working of which much credit was also due to an invention of Mr. C. F. Varley. It was Thomson who invented the galvanometer called by his name, and thus enabled fifteen words a minute, instead of one, to pass through an Atlantic cable. His siphon-recorder, introduced in 1867, was another great improvement, enabling cable-messages to be permanently recorded as on the system, for land-use, of the American telegraphist, Morse. After unsuccessful attempts in 1857, 1858, and 1865, the first practical working-cable, from Ireland to Newfoundland, was laid by the *Great Eastern*, in 1866, and the cable lost by breakage in the previous year was fished up from a depth of two miles in the ocean, spliced, and also laid. These submarine cables, now extended to most parts of the civilized world, are largely made in Great Britain, and are composed of copper wires twisted into a strand covered with alternate coatings of a pitchy mixture and gutta percha for insulation, this core being then inclosed in Manilla yarn and twisted iron wires for safety against friction from rocks and other submarine objects. The credit of exciting belief in the success of Atlantic telegraphy, and of promoting the work in a commercial and financial sense, is mainly due to the energetic American, Mr. Cyrus W. Field, of Massachusetts.

The principle of the telephone, an instrument for transmitting the human voice by means of electric wires, was practically applied by Reis of Frankfort, in 1860, and afterwards by Mr. Elisha Gray, of Chicago, but the first real articulating telephone appears to have been due to Mr. Alexander Graham Bell, born at Edinburgh in 1846, who became Professor of Vocal Physiology in Boston University, in the United States, and showed the instrument of his invention, in 1876, at the Philadelphia Exhibition. There have been various adaptations and improvements, by the famous American inventor, Edison, and others, and extensive use is now made of the apparatus which, in the United States, with its great distances, conveys the human voice for 1000 miles. In this

country, lines are laid which enable conversation to be carried on from London to Liverpool, Manchester, Birmingham, and other large towns, and the telephone is of great service for shorter distances, within the compass of London and other places. Professor Bell, by a simple adaptation of the electric current, also produced the photophone, an instrument capable of transmitting articulate speech along a beam of light. Another marvel of electrical development in these latter days is the phonograph, invented by Edison in 1877, which receives sounds upon a cylinder coated with wax, registers them thereon, and reproduces them at any subsequent time, so that the words of the dead, as in the case of the poet Browning, and of the living, for the gratification of foreign admirers, as in the case of Mr. Gladstone, have been again and again uttered in human hearing.

CHAPTER IX.

CIVIL AND RELIGIOUS FREEDOM.

The British slave-trade of 18th century—Its abolition by law—The trade denounced as felony and piracy—Success of the British cruisers—Slavery abolished in our colonies. Catholic emancipation and Daniel O'Connell—Disestablishment of the state church in Ireland—Compulsory church-rates abolished—Freedom of burial in churchyards conceded to Dissenters—Abolition of religious tests in the universities—Full civil rights granted to Jews—Mr. Bradlaugh in the House of Commons. Controversy in the Scottish church regarding patronage—The great secession of 1843—Formation of the Free Church of Scotland. The claim for "Women's rights"—Dr. Elizabeth Blackwell—The medical profession opened to ladies—Right of voting and of election to boards conceded—The Married Women's Property Acts.

At the opening of the nineteenth century, the one dark spot on the fair fame of Great Britain as a land of freedom lay in the legal recognition of negro slavery. No slave, as we have seen, could remain a slave on British soil, but the cruel and loathsome traffic called the slave-trade was legally practised by British subjects, and men, women, and children, in large numbers, were legally held as slaves in our West Indian colonies. It remained for some earnest, energetic men to vindicate the personal rights of mankind, without exception of race or colour. It was fitting that this country should play a leading and a noble part in the abolition of slavery, looking

A BRITISH NAVAL OFFICER OVERHAULING AN ARAB SLAVE-DHOW.

It is to the everlasting credit of Great Britain that she made immense sacrifices to abolish slavery in her own territories in 1808, and that she still continues to befriend the slave in every part of the world. Africa has always been the storehouse for the slave-markets, and even to this day the innocent villagers in the interior of that continent are captured by the Arab slave-dealers, chained in gangs, driven a thousand miles to the sea-coast, packed on board the slave-dhows lying in some secluded creek on the East coast, shipped to the seaports of South Arabia, and from thence, after countless horrors, forwarded for sale in the slave-markets of Western Asia. To stop this iniquitous traffic is the business of Her Majesty's naval squadron on the Zanzibar station; the pursuit and overhauling of these fast-sailing slave-dhows requiring both enterprise and courage on the part of Her Majesty's officers.



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to the share which she had, in earlier times, in establishing that iniquitous institution. The Elizabethan adventurers, seeking to interfere with the Spanish and Portuguese monopoly in slaves from western Africa, embarked in the traffic in 1562, when Sir John Hawkins shipped the first black cargo that came on board a British vessel. The trade, mainly conducted by ships from Bristol and, in the eighteenth century, from Liverpool and London, attained enormous dimensions. During the last twenty years of the seventeenth century, above 300,000 negroes were carried into captivity by Englishmen, and from 1700 to 1786, Jamaica alone imported more than 600,000. The revolting horrors of the "middle passage", the atrocious cruelty endured by tightly-packed human beings, during tropical heat, in the holds of the slave-ships, need no description here. In 1787, as we have seen, a society for the abolition of the slave-trade was formed in London. The active exertions of Clarkson and Granville Sharp, of Zachary Macaulay, and, within the walls of Parliament, of William Wilberforce, continuing for a period of twenty-one years, attained their end on January 1st, 1808. From that day, the traffic in slaves was illegal for British subjects, and the attempts which were made to evade the statute of March, 1807, under cover of the Spanish and Portuguese flags, were encountered by the severest legislation. The traffic was so lucrative that no money-penalty was adequate to the case, and the slave-ships were more crowded than before, the negroes being often flung overboard in case of pursuit, in order to retard the chasing vessel by the lowering of boats to pick up the people. In 1811, a bill, introduced into the Commons by Brougham, was unanimously carried, and from that time the slave-trade became, for British subjects, felony punishable with fourteen years' transportation, or from three to five years' hard labour in prison. In 1824, it was made piracy, punishable with death, and in 1837, the penalty became transportation for life. The influence and example of Great Britain caused most foreign governments, in course of time, to decree the abolition of the traffic in slaves, and, from the west coast of Africa, owing to the lack of markets beyond the Atlantic, the stealing of negroes has long been extinct. The efforts of the British slave-squadron were very effective, especially after the introduction of steam for navigation. Down to the middle of the nineteenth century, our cruisers swarmed upon the African coast and in the waters of the

Mexican Gulf, in order to intercept cargoes of negroes intended for sale in the Cuban market.

The work of British cruisers and their gallant crews in the cause of human freedom during this period may be illustrated by two narratives of thrilling interest, affording legitimate pride to all the fellow-countrymen of those who were engaged in the suppression of atrocious wrong. On Friday, the 22nd of April, 1831, His Majesty's brig *Black Joke*, commanded by Lieutenant Ramsay, came to anchor at Fernando Po, an island, held by Spain, in the Bight of Biafra, off the west coast of Africa, about twenty miles from the mainland. The commander of the ship there learnt from Mr. Mather, in charge of one of our colonial vessels, that he had just left in the Old Calabar river, which enters the Bight about 80 miles N.W. of Fernando Po, a large armed Spanish slave-brig, supposed to be almost ready for sea. He described her as the finest slaver that had been seen on the coast for some years, carrying one pivot-gun and four broadside guns, with a crew of about seventy picked men. Mr. Mather dined on shore several times in company with some of her officers, and he stated that, in the course of conversation, they made no secret of their intention of fighting if necessary. They even laughed at the idea of being taken by the *Black Joke*, with whose force they were well acquainted. Lieutenant Ramsay was not daunted by the nonchalant tone of the Spanish slaver's officers, nor by the report of her actual condition and force. The *Black Joke* put to sea from Fernando Po that very evening, and, sailing for the Old Calabar, commenced a strict blockade of the port. The vessel anchored each night at the mouth of the river, keeping a close watch, and, weighing anchor before daylight, she ran out with the land-breeze far enough not to be seen from the shore. On Monday, April 25th, about eleven o'clock in the forenoon, a large brig was seen from the masthead, standing out of the river under all sail. The *Black Joke's* topsails were immediately lowered, by which means the stranger was allowed to come in sight from the deck before her people made out who their antagonist was. She then altered her course, and all sail was made by the British cruiser in chase, with every preparation needed for a severe contest. The Spanish ship sailed so well that it was nine o'clock at night before the *Black Joke* could get within range. A shot was now fired ahead at the

foe as a signal to heave to. This was promptly returned by three broadside guns, and the wind then fell so light that both vessels had recourse to their "sweeps", the great long oars used during a calm. In this way a running fight was kept up until about half-past one on Tuesday morning. The *Black Joke* was then so near that it became evident a close action must ensue, upon which the Spanish captain hauled up his "courses" or lower sails, and with his sweeps so managed his vessel as to keep up a determined fire, of which nearly every shot told upon the spars, rigging, and sails of the *Black Joke*. Lieutenant Ramsay, in consideration of the superior number of guns carried by his adversary, as well as to spare, if possible, the lives of the wretched slaves in the Spanish vessel's hold, resolved upon boarding without delay. Fortunately a light air favoured his intentions, and the helm was put a-starboard. Meanwhile the men were ordered to lie down for shelter from the enemy's fire. Two steady men were to be ready to lash the vessels together. The two guns were loaded with grape, and their "captains" were ordered to fire directly the word "Board!" was given. All being prepared, the *Black Joke* ran alongside the slaver, the order to board was given, the two guns were fired, and Lieutenant Ramsay, with Mr. Bosanquet and about ten men, leaped on board; but from the force with which the two vessels came into collision, they unluckily separated before the rest of the boarders could follow. Mr. Hind, however, a midshipman not fifteen years old, the only officer left on board, with extraordinary presence of mind ordered all hands to the starboard sweeps, pulled alongside, got the vessels lashed together, and then boarded in support of his superior officers and their handful of brave seamen, leaving behind on the *Black Joke* only one or two wounded men. With this reinforcement the combat was soon decided. Those who continued to resist were quickly cut down, the rest ran below and begged for quarter. Mr. Pearce, a young midshipman, was pushed overboard by one of the Spaniards with a sabre, but succeeded in regaining his station by means of the fore-sheet. The captured vessel proved to be the Spanish brig *Marinerito*, a beautiful new vessel of upwards of 300 tons, armed with one pivot long-gun, a Spanish 18-pounder, and four broadside guns of the same calibre. She had twelve officers and sixty-five men, of whom fifteen were killed by shot or steel or drowned, and several wounded, some being very

dangerously stricken. There were found on board 496 slaves, of whom 26, owing to the necessity of confining them below during the action, were found dead by the captors when the hatchways were opened, although this was done the instant that complete possession was obtained. Of the remainder of the slaves, 107 were in such a state, from want of air during the confinement down below, that it was thought advisable to send them on shore at Fernando Po as the only chance of saving their lives. About sixty of these victims of human cruelty and greed died, and the rest were ultimately landed at Sierra Leone. All the slaves appeared to be fully sensible of their deliverance, and upon being released from their irons expressed their gratitude in the most forcible and affecting way. The *Black Joke* carried one pivot long 18-pounder gun, and one carronade of the same calibre, with a crew of 38 seamen and marines, and six officers. Her loss was one seaman killed, Lieutenant Ramsay severely wounded, Mr. Bosanquet (the mate) and five men also wounded, running and standing rigging much cut, spars considerably damaged, and port bow and quarter stove in.

Our second instance of slaver-capture is one in which, against far greater odds even than those encountered by the men of the *Black Joke*, and in a far more desperate fight, the dauntless courage and dogged determination of British sailors were most nobly and conspicuously shown during the earlier years of Queen Victoria's reign. On a bright summer morning, May 26th, 1845, in the Bight of Benin, on the west coast of Africa, Her Majesty's sloop of war *Pantaloon*, 10 guns, Commander Wilson, after a chase for two days of alternating strong breeze, light breeze, and calm, found herself within half-an-hour's row of a strongly-armed and thickly-manned Brazilian polacca, or three-masted vessel with jib-boom, much used in the Mediterranean waters. The wind had now fallen to a dead calm, with a swell, and it was needful to make an attack with boats. Lieutenant Prevost had charge of one of the whale-boats; Mr. Pasco, the boatswain, commanded the other whaler; Mr. Crout, the master, took the ship's cutter for his share. The seamen carried cutlasses, axes, and boarding-pikes; a few marines, with muskets, were placed in each boat. As the enemy was neared, two guns opened fire from her decks with round-shot, canister, and grape, dashing up the waters all round the boats of

the *Pantaloon*. After a full quarter-hour of this work, our marines opened fire, and the sailors, bending to their oars, carried the heavy craft through the water at amazing speed. The volleys of grape and canister, mingled with bits of chain, nails, iron-scraps, and even pebbles from the ballast, were "dodged" by skilful zig-zag steering, and very little damage had been done to our men when the boats closed with the foe, the cutter at the bows, and the two whalers at the starboard quarter. At the moment when the cutter bumped the polacca's side, and Crout and his coxswain grappled the high bulwark with boat-hooks, a concealed gun-port was flung open right in their faces, and a brass gun was run out ready to fire. Mr. Crout sprang into the port just clear of the muzzle, and was at once fiercely engaged with a half-dozen of Brazilians. The coxswain just escaped from the front of the gun at the moment of firing, but was blown by the wind of the explosion into the water beyond his boat lying below. In a few seconds he was helped out and was inside the port, aiding his officer with slashing blows. The two British heroes advanced abreast, striking down the slaver's men right and left as the other blue-jackets and the marines came on, through the port, over the bulwarks, up by the rigging and loose ropes. At the starboard quarter, Lieutenant Prevost and Mr. Pasco were first aboard, manfully plying cutlass and pistol against enormous odds, but aided by musketry fire from the marines in the boats. They soon cut a clear semicircle all around them, and were quickly followed by their men on to the blood-stained deck. A host of enemies were in front, roaring with rage, crying on their saints, and headed by a huge captain with a long black beard. The British sailors were quite over-matched by numbers, and were really beaten without seeming to know the fact. Prevost was knocked almost senseless by a blow from the hammer-end of a boarding-axe; Pasco was brought to his knees, covered with blood streaming from a sabre-cut on the crown of his head. The men were in little better case, when Prevost recovered his senses, dashed at the captain, and cut him down with a single sword-blow. Then the face of the battle changed, and the British, with a loud cheer, rallied to their work, and forced the enemy, foot by foot, across the deck, driving some of them to a jump from the bulwark into the sea. Meanwhile, Crout and his men were maintaining a fierce fight against great odds, and slowly

cut a lane through swarming foes until they joined their comrades. By this time, Crout's face was a ghastly spectacle in the pallor caused by loss of blood from many wounds, but he rushed at the enemy in a new charge, only to go staggering to his knees before he could close, and be there again wounded on the left shoulder and arm. A general British onslaught then drove the enemy either below hatches or overboard, or forced them to beg quarter, and the polacca was won. In this splendid little fight not a single one of the British assailants was left unwounded, their injuries, in most cases, being of a serious nature. A few of the victors and very many of the vanquished were killed. The vessel, styled, in Portuguese, *The Butterfly*, was found to be completely fitted as a slave-ship, and was, as such, condemned at Sierra Leone. Lieutenant Prevost was fitly promoted to the rank of "Commander", while his subordinates received due reward, and both officers and men gained a considerable amount in prize-money from the sale of the valuable ship and armament.

In 1839, Lord Palmerston carried a measure which gave large powers to British naval commanders, enabling them to detain vessels provided with fittings of any kind that implied use for carrying slaves. Between 1840 and 1848, our men-of-war captured 625 vessels, of which 578 were condemned by the courts, and nearly 40,000 slaves were thus made free. In August, 1833, the work of Clarkson and Wilberforce was crowned by the Act which freed slaves throughout the British colonies, with compensation of 20 millions sterling paid to the owners. Our latest efforts in favour of human freedom have been, and are being, made in eastern Africa. In 1873, British interference closed the slave-market at Zanzibar, and our cruisers are at this hour active in intercepting Arab slave-ships or dhows between the African coast and Arabian ports on the Red Sea and the Indian Ocean.

As regards religious freedom, we have seen that much was attained, except for the Catholics, after the Revolution of 1688, and that the eighteenth century witnessed the relaxation, if not the abolition, of disabling statutes that affected both Catholics and Protestant Dissenters. At the opening of the nineteenth century, however, all British citizens who were not in communion with the English Church lay, more or less, under the ban of the law, and were subject to restrictions which were irritating, insulting, and unjust, and, in

the case of Catholics, of a very serious kind. No Catholic peer could sit in the House of Lords; no Catholic could be legally chosen for the House of Commons. The other disabilities attached to the religious faith of the Catholics and of all their fellow-subjects not conforming to the Established Church will appear in the narrative that recites the removal of unjust distinctions based upon creed. "Catholic Emancipation" is an oft-told tale. The hero of the contest that ended in the victory of 1829 was Daniel O'Connell, whose election, in 1828, for the county of Clare was regarded by the Duke of Wellington and Sir Robert Peel as a menace of civil war, not to be resisted. The Catholic Association, formed by O'Connell in 1823, joined by the priests, organized and worked with consummate skill, and dissolved in March, 1825, in time to foil legislative interference, had aroused an enthusiasm which could not fail to impress prudent statesmen. The Catholic Relief Act, passed in April, 1829, admitted Roman Catholics to both Houses of Parliament, and to most of the public offices from which they had been excluded. In the earlier years of the present reign, nearly all other disabilities were removed, and in 1868 the office of Lord Chancellor in Ireland was thrown open to them. The work of creating religious equality, as concerns the Catholics in Ireland, was completed in the disestablishment of the State Church in that country. This is no place for the revival of bitter political and religious controversy, and we simply record once more the fact that, after a general election turning on the point at issue, in 1868, Mr. Gladstone, with a majority of about 120 in the Commons, carried his Bill in 1869, by which the prelates of the Protestant Church in Ireland ceased to sit in the House of Lords, and, after due provision had been made for the vested interests both of incumbents and curates, and of the Presbyterians and Catholics, as regards their pecuniary annual grants, the surplus property of the Irish Church, to the amount of seven millions, became national wealth, to be applied for Irish charitable uses. We believe it to be fact beyond dispute that the Protestant religion in Ireland has in no wise suffered, and that the hostility of Irish Catholics to Protestants, as such, has almost wholly ceased since the passing of this measure of relief and reconciliation.

The Protestant Dissenters had long been relieved, by Indemnity Bills, from the penal action of the Corporation and Test Acts,

passed under Charles the Second, requiring all municipal officers to receive the sacrament according to the rites of the Anglican Church. In 1828, those obnoxious statutes were formally repealed. In 1836, marriages in Nonconformist places of worship, and at Registrars' offices, were legalized. A contest of more than forty years' duration was needed for the abolition of compulsory church-rates. Dissenters who resisted payment for the support of the National Church were harassed by distress-warrants, under which their rooms were rifled of furniture, and their plate-baskets emptied of forks and spoons. The struggle raged in the parish vestries and in the law courts, as well as within the walls of Parliament. Some Nonconformists suffered imprisonment rather than pay. The Braintree case, named from a parish in Essex, after eighteen years of litigation, and thirteen legal decisions, was a virtual death-blow to church-rates, as a compulsory matter, by establishing the principle that no rate could be valid which was not made by a majority assembled in vestry. A deep impression was made on the public mind by the imprisonment of John Childs, of Bungay, in Suffolk, and of John Thorogood, of Chelmsford, and churchmen began to feel ashamed of their privilege. In 1868, Mr. Gladstone carried a measure for abolition of these payments, except in a voluntary form, and the grievance was thus for ever removed. The Dissenters then strove for the right of conducting burial-services in all parochial places of sepulture. An Act of 1853 had required ground for Nonconformist burials to be provided in all new cemeteries, but in thousands of parishes there was no other place of rest for the dead than the churchyard. It thus came to pass that, in many a rural parish, unbaptized children and adults were buried without a service of any kind, and Nonconformist ministers, with mourning relatives, were forced to stand outside of churchyard walls, while prayer was offered, and hymns were sung, and words of consolation were uttered over the remains of departed friends. Dr. Tait, Archbishop of Canterbury from 1868 to 1882, a Scot of Presbyterian descent, admitted that the state of the law in this respect was barbarous, and in 1880, under Mr. Gladstone's government as Premier, freedom of burial in parish churchyards was accorded to Dissenters, who could choose their own form of religious service over the dead, and appoint whomsoever they wished to conduct it, whether they were burying their relatives in churchyard or cemetery, in ground "consecrated"

by a Prelate of the Establishment, or only hallowed by its Creator.

The completion of religious freedom for Nonconformists needed the abolition of religious tests in respect to education. The restrictions which existed for many years past the middle of the nineteenth century were such as to confine to Episcopalians most of the advantages of the universities and of the ancient grammar-schools and other educational foundations in the land. At last, in 1871, after repeated rejection and desperate resistance in the House of Lords, an Act threw open all lay-degrees to Nonconformists at Oxford and Cambridge, and at both those universities many able men, not in communion with the Established Church, have attained positions of honour, emolument, and authority, without the occurrence of any of the predicted mischief to the religious character or to the social peace of great national institutions. In 1873, religious tests were also abolished at Trinity College, Dublin.

The persecution of the Jews is an old story in British records, as in those of all other Christian countries. Banished from the land under Edward the First, and permitted to return under Cromwell, they received some recognition in 1723 by a statute allowing them to take oaths in a court of justice without the words "On the true faith of a Christian". Only in the nineteenth century, and not fully until nearly the close of that period, was the Jew admitted to a citizen's rights. In the city of London, he could not, until 1832, carry on any retail trade, or receive the municipal freedom. In 1833, he could become a barrister; in 1837 a Jew became Sheriff, and in 1845 the posts of Alderman and Lord Mayor became attainable, under an Act which threw open municipal offices to Jews, on the signing of a declaration in place of taking the usual Christian oath. In 1846 and 1847, they received the same rights, in respect of their schools and places of worship, of education and charities, and legalization of their marriages, as were enjoyed by Protestant Dissenters. The Act of 1871, repealing tests at the universities, included them. A strenuous opposition was made to their admission within the walls of Parliament. Bills passed through the House of Commons were again and again rejected in the Lords, mainly through the influence of the "high churchmen" and the Bishops. In 1847, Baron Lionel Rothschild was elected M.P. for the City of London, and in 1850, having

never yet taken his seat in the Commons, he strove in vain to be allowed to omit from the Oath of Abjuration the words "on the true faith of a Christian", and was obliged to fall back again to his old place in one of the seats under the gallery, as a stranger in the assembly to which he had been repeatedly chosen by the votes of one of the greatest English constituencies. In 1851, Mr. David Salomons, a Jew, elected M.P. for Greenwich, after declining to utter the words unfitted for an honest Jew, actually took his seat among his fellow-members, and only withdrew, after taking part in some divisions and making a speech, on the appearance of the Serjeant-at-arms, summoned by the Speaker, who had, however, in ordering Mr. Salomons to retire, called him "the honourable member". At last, in 1858, the Lords passed a Bill allowing either House to modify at pleasure its form of oath, and the Commons was henceforth open to Jews. A subsequent Act enabled them on all occasions to omit words implying Christian belief. In 1885, for the first time in our history, a Jew, Lord Rothschild (Sir Nathaniel Meyer de Rothschild), took his seat in the House of Lords, raised to that dignity on the advice of Mr. Gladstone as Prime Minister. In 1869, a statute dispensed with an oath, in favour of a form of promise and declaration as regarded utterance of the truth, if any person, in a court of justice, objected to any religious formula, and finally, in 1888, after a long and most discreditable struggle in the House of Commons in the case of Mr. Bradlaugh, an avowed atheist, it was provided that in all cases and places whatsoever an affirmation might lawfully replace an oath, subject to the same penalties as attach to perjury. Thus was removed the last fetter upon human consciences in Great Britain, and thus did bigotry at last cease to pry into that which concerns only the individual and a higher Power, to which alone he is responsible in such matters.

A noble display of independent spirit, alike in ministers and laymen, was made in Scotland, in 1843, by the movement of secession from the Presbyterian establishment which ended in the creation of the Free Church. A revolt was made, in the interests of freedom, against what were held to be the undue claims of ecclesiastical lay-patronage under the Queen Anne Act of 1712. The system was the cause of chronic schism and discontent, in frequently obtruding on Church-livings clergymen not welcome to

the laity. In 1834, a Veto Act of the General Assembly forbade the appointment of any minister contrary to the will of the people in the parish, as represented by a majority of male heads of families who were full members of the Church. Litigation and conflict arose between the civil and ecclesiastical authorities, and a crisis came when the House of Lords, on appeal from the Scottish Court of Session, required the presbytery of Auchterarder parish, in Perthshire, to induct a lay-appointed minister without regard to the dissent of the parishioners. In 1842, the General Assembly, by a majority of 241 to 110, retorted by a Claim of Right, which declared that, unless relief were granted by Parliament and the Crown, the Church must separate from the State. A motion for inquiry was rejected in the House of Commons, and in May, 1843, at the meeting of the General Assembly in Edinburgh, the ex-Moderator, Dr. Welsh, after handing a protest to the Queen's Commissioner, formally began a secession by marching, with his supporters, out of St. Andrew's Church, the place of meeting. At another gathering thereupon held by the seceders, 474 ministers, out of a total of 1203, resigned their churches, incomes, and manses, or parsonages, and the famous preacher and divine, Dr. Chalmers, was appointed chairman of the first Assembly of the Free Church of Scotland. The heroic attitude and conduct of those who thus faced sacrifice and suffering of no common order and degree aroused the admiration of all lovers of freedom in the civilized world. Some of the best and greatest men in Scotland were found in the new Church, which included, among its ministers and laymen, not only the illustrious Chalmers, but Dr. Candlish, Dr. William Cunningham, Dr. Robert Buchanan, Dr. Guthrie, and Hugh Miller. The principle of self-support in an ecclesiastical body was nobly vindicated by the efforts which, within forty years of the memorable day of disruption, raised 17 millions sterling for the building of churches, manses, schools, and colleges; for the support of the same; and for foreign, colonial, continental, and Jewish missions.

The change made in the position of women during the latter half of the Victorian period is one which may well be connected with the development of freedom. The air is full of "women's rights", or the claim made on behalf of what has been called, with only a modicum of truth, and, in many cases, with bitter irony,

"the weaker sex". In its extreme form, this claim demands that women, in legal, political, social, and educational status, shall be absolutely equal with their sometime tyrants, men. The origin of this movement has been traced to the United States, where a very able and energetic lady, Miss Elizabeth Blackwell, a native of Bristol, in this country, graduated, in 1849, with a medical diploma, at Geneva, in New York State. In 1851 she began to practise, with much success, in New York city, and in 1869, returning to England, she became an active lecturer and writer in behalf of social reform and of an improved position for her sex. It is in the United Kingdom, the Australian colonies, and the United States, that the greatest advances have been made towards complete independence for women, and, in many points, with highly beneficial results. We have here only to trace briefly, within the British Isles, the movement which has already influenced all modern society in Europe, North America, and India, with a force that has operated in laws, literature, and institutions. The change in female education is noticed under another head, as also the achievements of British ladies, during the Victorian age, in the field of literature, and even of science. The application of steam and of other labour-saving agencies to manufactures first gave to working-women a position of economic independence, and, in other modes of toil than those of the great factory, women have forced their way to a place alongside that of the male sex. In the person of Mrs. Garrett Anderson, M.D. in 1865, the medical profession was thrown open to ladies, and, though the Society of Apothecaries shortly afterwards closed their door of entrance, and the British Medical Association, in 1877, declared women to be ineligible as members, British ladies obtained a foreign education and diplomas in medicine, and returned to this country to practise. There is now no legal hindrance in their way to becoming medical practitioners, and in 1892 the British Medical Association almost unanimously rescinded their hostile resolution. An immense change has taken place in feminine influence upon social progress through the concession to women of the right of voting in municipal elections, as well as in those for school-boards, boards of guardians, and the county councils. They also sit, with great benefit to the adults of their own sex and to young children, as members of boards of guardians and of school-boards. They cannot yet (1895) vote in

parliamentary elections, but within the last few years they have, on both sides of politics, shown great activity as canvassers, and as speakers at political meetings. Apart from the legislative enactments which have provided protection for women who work in factories, and have awarded more severe and searching penalties to their personal ill-treatment by men not connected with them by blood or by marriage, the law has done very much to advance wives and widows from a position where, at the beginning of the Victorian age, they scarcely possessed any rights at all. In 1839, a new statute granted to the mother the custody of all children under seven years of age. The Divorce Act of 1857, and a law passed in 1878, extended this term, for wives of blameless conduct, to sixteen years. Up to 1870, apart from the security provided by marriage-settlements, all that a woman acquired by inheritance, or by her own separate earnings, belonged at once to her husband. The Married Women's Property Acts of that year and of 1874 guarded from his grasp all property acquired after his desertion of the common home, or his removal by a decree of judicial separation, as well as her own earnings, if they lived together. Virtuous, prudent, and hard-working wives were thus, in their own interest and that of innocent and helpless children, effectually protected from plunder by the drunken and dissolute wretches who had abandoned every duty incumbent on a citizen. In 1878, another excellent law gave power to a magistrate to pronounce a judicial separation of a wife from a husband who had violently ill-used her. As regards a woman's rights in property, almost complete justice was rendered by the famous Act of 1882. A wife thereby has a separate property in all her own realty and personalty, and may make contracts concerning it, and dispose of it, with the same freedom as a single woman. Lastly, the Infants Act of 1878 accorded to a widow the natural right, hitherto withheld, of being guardian to her children.

CHAPTER X.

THE NEW DEMOCRACY.

Benefits of an extended franchise—Instances of moral advance in the working masses—The contest of labour against capital—The "Combination Laws"—Strikes and trade-unions—The Trade-Union Act of 1871—Employers and Workmen Act—Agitation among agricultural labourers—Joseph Arch—Importance of the County Councils and Parish Councils Acts.

In the Reform Acts of 1867-68 and 1884-85 we saw the creation of a new power in the state by changes of franchise which have raised the number of parliamentary voters to above six millions. The British workman and labourer thus became the chief source of political authority, especially in the town constituencies. Entering into no controversial or speculative matter, we may safely affirm that hitherto the widening of the basis of the constitution has done little else than produce its natural effect of giving increased stability to the whole structure. The British working man is, in the best sense, conservative; he is a good and loyal subject of the Crown, as the representative of law and order. By admission to the functions of a law-maker, in the choice of those who actually legislate on his behalf, he has ceased to be a law-breaker, and the most vivid contrast exists between the state of things that prevailed, early in the century, amid the outrages wrought by the Luddites and by starving peasants, or, later on, amid the disorders due to "physical force" Chartists, and the present almost perfect submission of the working class to the rule of legitimate authority. Socialism, in the obnoxious sense, presents no attractions to the average British voter either of the artisans or the agricultural labourers, and the senseless atrocities of anarchism arouse in him no feelings except those of amazement, abhorrence, and utter contempt. The true democratic spirit is that which, in practical affairs, and against the evils of the time, substitutes self-assertion for helpless and hopeless resignation: it is instinct with a belief in human dignity, and in the possibility of a far higher life in this world for the masses of mankind. Its principles are those of generosity, trust, and self-respect. Democracy, at its best, demands, not equality of station or wealth, but equality of opportunity, a career open to ability and effort. The workers who vote believe that they are the real creators of the nation's wealth,

and their efforts to emerge into full, unfettered life include just aspirations for improvement in their mental, material, and social condition.

In proof of the vast moral advance that has been made during the nineteenth century amongst the masses of the British nation, we may adduce three occasions, in the latter half of that period, on which the artisans displayed a noble and unselfish spirit which assuredly they would not have shown in its earlier years. We have seen how, during the Cotton Famine in Lancashire, the unemployed masses were influenced by the knowledge that their condition was largely due to a contest waged on behalf of human freedom. We now refer to instances in which either admiration, or indignation, or both feelings intermingled, were avowed in causes which in nowise concerned the private interests of those who made such striking demonstrations. The great Italian patriot and soldier, Garibaldi, who had played so magnificent a part, in 1860, in freeing Sicily and southern Italy from Bourbon tyranny and misrule, was afterwards engaged, with more heroism than practical wisdom, against Italian troops, on behalf of Italian unity, when they interposed to prevent his collision with the French. In August, 1862, he was severely wounded at Aspromonte, near the Strait of Messina, and retired to his home in the islet of Caprera, off the coast of Sardinia. In 1864, he arrived in London, and was received in the streets by the populace with enthusiastic demonstrations of delight and regard such as monarchs have rarely witnessed. The working masses of our people knew little of Italian politics, and cared for nothing except the fact that here was a man who, with nothing to gain, and everything to lose, had drawn his sword and fought for the completion of Italian freedom.

Not less striking, in a widely different case, was the attitude of the British artisans in 1875. In July of that year, the Lords of the Admiralty, with the best intentions, and desiring to avoid complications with some petty foreign nations, issued a circular to captains of British men-of-war, instructing them to hand back to the owners any fugitive slaves who might take refuge under our flag. An outburst of indignation, largely shared by the working-men voters, arose at this monstrous reversal of our time-honoured policy in respect to slaves. The Ministry was shaken, and the circular was at once withdrawn. A new one was issued, with div

excuses and explanations, but the people would have no parleying with slavery, and there was nothing to be done except to allow the old principle to resume its sway, and the Union Jack, floating on sea or land, over ship or boat or fort, to remain an inviolable shelter to all human beings who have escaped from bondage to a point within the sacred sphere of its authority.

It was in the same year and session of Parliament that the democratic spirit was so powerfully shown in a memorable dispute between Mr. Plimsoll and the Government. The work of that philanthropist will be noticed hereafter. We need here only state that, in his place in the House of Commons, roused to frenzy by what he believed to be the indifference of the Government to the lives of our merchant seamen, he used language of great violence regarding certain shipowners, and, with clenched fist and most vehement gestures, appealed to the occupants of the Treasury-bench. Grossly out of order, he declined to apologize, and rushed from the House. His opponents thought that his cause was ruined, but there never was a greater mistake. Within the next few days, the working men, in a series of public meetings, held throughout the country, so warmly took up the matter as to fairly frighten the Ministry into hurrying through Parliament a measure that, at least in some degree, adopted Mr. Plimsoll's views.

It is in the contest of labour against capital, of workman against employer, that the nineteenth century has seen, in Great Britain, the greatest and most important development of democratic effort. Trades Unions, a form of industrial co-operation almost unknown between the time when the old craft-guilds were suppressed under Henry the Eighth and his successors, and the later years of the eighteenth century, have attained, under Queen Victoria, a truly formidable strength. Attempts at revival were regarded with great jealousy by statesmen and capitalists as being opposed to public policy, as tending to monopoly, as restraints upon trade, and as politically dangerous. Hence came enactments known as the "Combination Laws", forbidding, under severe penalties, the formation of unions amongst workmen for obtaining better wages or improved conditions of labour. In 1773, a statute provided that the wages of weavers of silk, in London and Middlesex, be periodically fixed by the Lord Mayor or a justice of the peace, with a fine of £50 for masters paying more or less than the appointed

rate, and of 40*s.* for artisans asking or taking more or less. In 1782 and 1785 Acts imposed a fine of £500 and twelve months' imprisonment on anyone contracting with or encouraging a workman in calicoes or linens, or in iron or steel, to leave the country. In 1799, another Act assigned three months' imprisonment for journeymen in all trades who should combine to raise wages or lessen hours or quantity of work. In 1824 and 1825 all these laws were repealed, and then came the first of the modern conflicts between capital and labour known as "strikes". The wool-combers of Bradford, in Yorkshire, and Leeds, withdrew from work for a rise in wages, and, helped by operatives in other towns, were able to pay large weekly sums to the men on strike. This combination of men who were willing to set aside their own individual interest for the advantage of the class to which they belonged ended in total failure, after twenty-two weeks of idleness, and a loss of wages amounting to £40,000, about half of which had been recouped by subscriptions to the union. The men returned to work at the wages they had been receiving five months before, and this has been the termination of many, though by no means of all, the attempts of Trades Unions to enforce a rise in the rate of earnings. The repeal of the Combination Laws had left the members of Trades Unions still open to much legislative interference from old statutes against "conspiracy" and "sedition" which were turned against them, and men were sentenced to transportation for the "crime" of binding themselves together for mutual support in endeavours to better their condition. Even if a verdict were not obtained by the prosecution, the trade societies were often crippled, and sometimes ruined, by the expenses of the defence. In 1837, after the failure of a strike in Glasgow, five men were sentenced to seven years' transportation for "conspiracy and illegal combination", but a subsequent inquiry in the House of Commons elicited from a majority of the masters or employers an admission of the superiority of the union over the non-union workmen. In 1847 and 1848 union workmen at Sheffield had to spend over £7000 in defending men who were convicted and sentenced, with reversal of the judgment in a higher court. The injustice towards Trades Unions was this, that the members were liable to prosecution and punishment for doing certain things that another person, not a member of any union, might lawfully do. On every side, the law

frowned upon these combinations of workmen in order to secure the most favourable conditions of labour by the raising of wages, the reduction of hours, and the regulation of overtime, piecework, apprentices, methods of discharge, and the general modes of conducting the business of factories and workshops. We have seen the excellent developments of thrift in the co-operative societies formed by workmen, and yet, so late as 1867, the Court of Queen's Bench laid it down that a friendly society, which was also a trades union, could not employ the law in order to enforce a claim for debt. By degrees, however, public feeling and opinion had been undergoing a change. Unprejudiced minds saw that the Bar, the Stock Exchange, and the medical profession were, in fact, nothing but trades unions, with arrangements settling the price of labour, and with a system of rules and etiquette. It was found that whatever evils attached to the unions, they were infinitely better than the former secret societies, which had caused the outrages perpetrated by "Luddites", and the time drew on when the press, the pulpit, the platform, and Parliament viewed these powerful organizations with approval, and when leading officers of unions were admitted to seats on royal commissions and in the House of Commons. The Trades Union Act of 1871 swept away all the vexatious civil disabilities, and expressly enacted that no members of such bodies should be liable to criminal prosecution, for conspiracy or otherwise, because the purposes of their union might happen to be "in restraint of trade". A statute of the same year strictly defined, in the interest of non-unionists, the offences of molestation and obstruction. Under this salutary legislation, workmen became free to unite for any purpose not in itself criminal, and in 1875 the Employers and Workmen Act put masters and men on a perfect equality in matters of contract, as they long had been in Germany, Italy, and France, under monarchical, imperial, and republican rule. Of late years, arbitration, conciliation, negotiation, and mediation between employers and employed have wrought much good in averting strikes that could only bring mischief to all concerned.

It was in 1872 that the British public were startled by the first appearance, in modern times, of the agricultural labourers as men combining and agitating for a rise of wages. It was like the dumb man speaking, or a bovine animal assuming the attributes of our

race. The leader in this remarkable movement was Joseph Arch, a native of Barford, near Warwick, a farm-labourer, a Methodist preacher, and now (1896) for the third time a member of the House of Commons for a county constituency. This last fact alone strikingly shows the vast stride made, within these later years of the century, by the popular element in our constitutional system. An Agricultural Union was formed in South Warwickshire, after an address had been delivered by Arch to a thousand men gathered under a great chestnut-tree. The movement spread into Suffolk, Norfolk, Lincolnshire, and other quarters, and was aided by contributions from the Trades Unions of miners and artisans. Some improvement in wages, in many quarters, was the result, but the question has since become merged in others concerned with allotments, rents, and a transitional state of things in land, of which the issues lie in an unknown future.

In the spring of 1894, a statute of immense reach and importance received the royal assent. It completed the enfranchisement of the agricultural labourer by placing him, for self-government, on a level with those dwellers in provincial towns who, by municipal reform, long since acquired the control of affairs connected with the payment of rates. The Parish Councils Act, granting local government to dwellers in country districts, forms a great supplement to the County Councils measure, or Local Government Act, of 1888, extended to Scotland in the following year. That important statute created, in England and Wales, sixty "administrative counties", with aldermen and councillors, to control affairs which were previously regulated by irresponsible justices in quarter-sessions. Rating and assessment, bridges, lunatic asylums, reformatories, the registration and polling of parliamentary electors, the maintenance of roads, and numerous other matters, including a share in the management of the county-police, were thus brought into the hands of persons freely elected by resident ratepayers. The Parish Councils Act, for good or for evil, swept away the time-honoured feudal rule of the parson and the squire, and made the vote of the labourer equal to theirs at parish meetings for the election of overseers, the management of allotments, the control of sanitation, the sale, letting, and exchange of parish property, and the regulation of certain parish charities. The election of poor-law guardians is so largely modified as to make them, for the first time,

responsible to the class which is most deeply interested in the administration of the Poor Law. The villagers, including women-householders, and all lodgers and servants that are on the Parliamentary register, are at length, in these closing years of the nineteenth century, made the arbiters of their own lot in many matters of high importance, over which they had hitherto possessed no more control than the cattle which they drove afield.

The General Election of 1895 afforded striking proof of conservative feeling in a majority of the British democracy. The vote of the constituencies changed a Liberal majority of 28 into a Conservative majority of 152. In Ireland, the "Home Rulers" or "Nationalists" increased their numbers from 80 to 82, but the advocates of grave constitutional changes concerning Ireland and the House of Lords suffered a net loss of 6 seats in Wales, 11 in Scotland, and 81 in England. In England the Liberals became thus outnumbered, in their Parliamentary representation, in the proportion of three to one, and a veto was given to their demands for Home Rule, Disestablishment, and the "Mending or Ending" of the hereditary legislative body. The "Liberal Unionists", henceforth absorbed in the Tory or Conservative party, increased their number of representatives from 45 in 1892 to 71 in 1895. The whole number of voters who actually recorded their opinions was, within two hundred, 4,777,000, and it is remarkable that the whole number of Conservative and Unionist votes only exceeded by 103,000 those of the Liberals and Nationalists. The enormous change in political parties within the House of Commons was, in fact, due to so small a swing of the political pendulum as the transference of about 150,000 votes from one side to the other. The real preponderance of conservative feeling and opinion in England, as distinguished from the other countries forming the United Kingdom, was, however, indicated by the large number of seats obtained by Tory candidates without any contest. A notable fact of this election was that the candidates of the "Independent Labour Party" were uniformly defeated at the polls. The British working-man, indeed, in town and country alike, has usually preferred to intrust the interests of labour to the efforts of men not actually of his own class, and is by no means backward in supporting candidates of aristocratic birth, many of whom are destined, in the course of nature, to legislate for the country in

the House of Peers. The new democracy, displaying a change of mood rather than a change of principle, now appeared subject to a lethargic indifference as to the "heroic" legislation on their behalf which had been undertaken by Mr. Gladstone's successors on his retirement from political life in 1894. A close alliance of the landowning Lords, the clergy of the Establishment, the great and powerful alcoholic liquors interest, and the plutocracy in general, triumphed for a time over the assailants of political and social mischiefs which Radicals were seeking to remedy. Whatever the future may have in store, the responsibility for the continuance of evils that are within the reach of legislative remedies can rest only with those who, as the vast majority of voters under a system of household suffrage, are the arbiters of their own destinies.

CHAPTER XI.

RELIGIOUS REFORM.

Increase of religious activity—Church reform effected—The "Oxford Movement"—Eminent leaders in the Church of England—Bishop Wilberforce and Archbishop Tait, Bishops Thirlwall, Fraser, and Lightfoot, Dean Stanley—John F. D. Maurice, Charles Kingsley, and Frederick W. Robertson—Extension of parochial work—Lay-help—Increase of episcopal dioceses in the colonies—Missions to the heathen—Work of the Religious Tract and British and Foreign Bible Societies—Young Men and Women's Christian Associations. Nonconformists in England—Wesleyans—Rev. Morley Punshon—Independents or Congregationalists—Dr. Binney and John Angell James—The Baptists—Rev. C. H. Spurgeon. The Presbyterians in England and Ireland. Religious denominations in Scotland—The Established Church—United Presbyterian Church—The Free Church. The Salvation Army. The Roman Catholic Church in England.

The nineteenth century has witnessed a great increase of religious activity and zeal, and much good work in Church-reform. In later years, especially, the ministers of all sects have taken a more active part than ever before in the amelioration of social mischief and wrong; religious bigotry has been lessened in a marked degree, and the clergy of all denominations meet on platforms in advocating and promoting good works, without distinction of class or creed, and from a sole regard to their common humanity. Activity and toleration have become the chief features in the modern religious world of the British Isles. The Church of England herself, representing the religion of about one-half of the

people of this country, as distinguished from Scotland, Ireland, and Wales, is very tolerant and comprehensive, in accordance with the general tendency of the times. Among the administrative reforms to which the Establishment has been subjected during the Victorian age, something has been due to public opinion acting through legislation, and far more to a revived spirit of zeal working within by voluntary effort.

A much-needed change in church affairs was wrought by the action of the Ecclesiastical Commission established, in 1836, by Act of Parliament. The revenues of the sees were rearranged on a more equitable basis, many sinecures were swept away, and the funds thus acquired were applied in aid of poor benefices and the endowment of new districts created to meet the religious needs of populous places. In 1838, the Pluralities Act corrected the abuse of non-residence, and compelled parish-priests to remain in charge of their flocks, except by express leave of the bishop to the contrary, for at least nine months of the year. In the previous year, the Tithe Commutation Act, changing the tithes, or a tenth of the annual produce of land and stock, into a rent-charge, payable in money according to the average price of corn during the previous seven years, removed a fertile source of disputes between the country clergy and their chief parishioners, which had become very scandalous in its effects. In 1843, a number of districts in populous towns were supplied with new churches and ministers, duly endowed for the work to be done, and these were called "Peel parishes", from the prime minister of the time. This action of the Commissioners soon led to a vast extension of church-building by the voluntary contributions of the laity. Dr. Blomfield, Bishop of London from 1828 to 1857, was a very active prelate in his important diocese, and a most zealous promoter of church-building. Since 1837, the number of benefices in the Church has grown, through the subdivision of large parishes, from about 10,700 to nearly 14,000, a fact which represents the attempt made to overtake the increase of spiritual need and of many secular wants due to the vast growth of population. A corresponding increase in episcopal sees, including those of Manchester, Ripon, St. Albans, Truro, Newcastle, Liverpool, Southwell, and Wakefield, with the appointment of many suffragan bishops, has provided the means of closer supervision of ecclesiastical work.

The great inner revival in the English Church is traced to what is called the "Oxford Movement", due to a body of graduates, Newman, Pusey, Keble, Manning, Faber, Froude and others who, in the famous *Tracts for the Times*, issued between 1833 and 1841, sought to bring the Anglican Church to the "Catholic" pattern, which appeared to them to involve a necessary belief in the high intrinsic efficacy of the sacraments, and in the authority of a priesthood duly ordained by bishops in the apostolic succession, as the sole conveyers of sacramental grace. The standard of Catholic truth was sought in the teaching of the Fathers of the Church during the first four centuries of the Christian era. It is notable that some of the leaders of the new school, including the late Cardinals Newman and Manning, seceded to the Church of Rome. It is quite certain that those who remained in the Anglican communion were instrumental in effecting a vast change, with many good effects, in the Anglican Church. There arose, along with a "high" and ornate ritual, a great development of church-building and church-restoration, an increase of devotion and liveliness in the church-services, and a higher standard of clerical work and life in dealing with the spiritual and mundane wants of the ignorant, depraved, and necessitous laity.

Among the prelates of the Church since this revival who have been marked by zealous attention to the duties of the episcopal office, none was more able or distinguished than Dr. Wilberforce, Bishop of Oxford from 1845 to 1869, and then of Winchester until his sudden death, by a fall from his horse, in 1873. This eminent man was third son of the famous William Wilberforce. He earned the title of "remodeller of the episcopate" by his incessant vigilance and tactful exertions, and, by his social gifts, and his skill as a speaker in the pulpit, on the platform, and in Parliamentary debate, he became one of the most popular and prominent men of the age. There are other dignitaries of the Church whom we shall meet for a moment hereafter in connection with theological authorship.

Amongst those of the broad, or liberal school who have done much to leaven the spirit of the age in Great Britain with Christian sympathy and tolerance we may note Archbishops Whately and Tait, Bishops Thirlwall and Fraser, Dean Stanley, and the Reverends F. D. Maurice, Charles Kingsley, and F. W. Robertson. Whately, an Oxford graduate who was Archbishop of Dublin from 1831 till

1863, was a man of powerful intellect, fearless speech, and brusque manners, and was full of honesty, sagacity, charity, and justice. He was the foe of bigots in every kind, and did much to recommend the Christian faith to sober-minded and impartial judgment.

Archbishop Tait, a native of Edinburgh, who became successively Fellow and Tutor of Balliol College, Oxford; Head-Master of Rugby; Dean of Carlisle; Bishop of London, and Archbishop of Canterbury from 1868 to 1882, was the first Scot that ever rose to the ecclesiastical headship of the English Church, and the most distinguished man that had, for centuries, held that position. Untiring in all good works, tolerant in opinion, he was, in Church government, the incarnation of good sense and judicial moderation. His Presbyterian parentage had a direct influence upon his character and career in reference to the broad comprehensiveness that enabled him to do justice and to extend his sympathies towards the religious communities of the United Kingdom that lay outside the pale of the Anglican Church. No primate, save perhaps the meek and gentle Tillotson, Archbishop under William the Third, ever lived on such friendly terms with Nonconformity, or did so much to foster Christian charity and good feeling amongst "all sorts and conditions of men". After a course of study at Edinburgh Academy and Glasgow University, he took an "exhibition" to Balliol College, Oxford, and won a first-class in the final classical examination. Succeeding at Rugby the illustrious Arnold, a man of the highest mark, not only as a schoolmaster, but as an embodiment of the broadest spirit of Christianity, Tait did not suffer by comparison even with so high a standard, and, after seven years of intensely hard and thorough work, he was appointed, with his health somewhat shaken by his toils, to what was supposed would be a sphere of rest in the Deanery at Carlisle. With repose, however, Tait would have little concern. He set up the novelty of a daily service in the Cathedral, he promoted the efficiency of the schools, he made his way into the abodes of the poorest citizens. A terrible blow came upon his happy home in the loss by scarlet-fever, in 1856, of five little daughters within the space of a few weeks. The summer of the same year saw his transfer, by the Queen's own motion, to the Bishopric of London, as the successor of Blomfield. The lovers of routine and respectable ease in the episcopal life were startled by the energetic

proceedings of the new prelate. As a preacher in omnibus-yards to gatherings of drivers and conductors, and at the bedside of patients in hospital-wards, the Bishop made his way into places where a man of his order had rarely been seen before. He instituted the evening sermons at St. Paul's Cathedral, and, in the later time of his episcopate, he made his famous, spirited, and successful effort to deal with the fearful spiritual destitution of the vast masses of the London workers. Summoning the wealthy laity to the work, and bidding his clergy appeal to their flocks, he earned the gratitude of all religious men of every school by the practical results of the "Bishop of London's Fund". Within the first five years of its existence, about £350,000 was raised for the erection of churches, parsonages and schools in the poorer parts of the metropolis. Above seventy new ecclesiastical districts had been formed into separate and endowed Church-parishes, and a whole army of Scripture-readers and "mission women", with one hundred clergymen added to the permanent working-staff of the diocese, were carrying the light of the Gospel into the dark dwellings of London heathenism. Admirably aided by his wife in all his labours, Dr. Tait, in the garden-parties at Fulham Palace, extended the most genial and charming hospitality to the clergy of the whole diocese, not forgetting the humblest curate under his episcopal sway. In 1868, he was well chosen to become Archbishop of Canterbury on the death of Dr. Longley. His fourteen years' occupancy of this exalted position was marked by the same qualities of energy, moderation, sound judgment, breadth of mind, and goodness of heart, as he had displayed in all the previous stages of his noble career. One of the last acts of Archbishop Tait, before he was seized with fatal illness, was the despatch of a small contribution to the "Salvation Army", a body whose efforts he was specially anxious to utilize in behalf of the cause of temperance in strong drink.

In Bishop Thirlwall, the Church of England possessed a man who was foremost in the intellectual ranks, not only of the clergy, but of Great Britain, and among the foremost, for mental ability, not only of his time, but of all time. His intellectual capacity, learning, and strength of judgment, as displayed in the Charges to his clergy which reviewed the momentous ecclesiastical questions of his age, have never been surpa[illegible] Church.

His masterly power, breadth of grasp, calm wisdom, pellucid candour, exact logic, and exquisite felicity of style in dealing with controversial questions of high importance, evoked the admiration not only of the Anglican clergy of every school, but of all Nonconformists that could appreciate so wonderful a combination of mental and moral gifts. Having won rare distinction as the historian of ancient Greece, and conferred honour on his academic nurse, Trinity College, Cambridge, he became Bishop of St. David's from 1840 till his death in 1875.

Dr. Fraser, Bishop of Manchester from 1870 till 1885, after gaining high distinction as an Oxford student and as an authority on elementary education, rendered rare service to Christianity and to the English Church among the shrewd Lancashire artisans by his energetic labours, his strong sense, and his broad sympathy, and his death was deeply deplored as a loss to mankind in his important sphere of labour and rule, not only by the members of his own communion, but by Nonconformists of every class.

The illustrious Dr. Lightfoot, Bishop of Durham, was another foster-child of Trinity College, Cambridge, who died in December 1889, after ten years of devoted service as a prelate. The Church of England has rarely been served and adorned by a greater mind than his. His works in theological literature and ecclesiastical history are a permanent treasure for Christendom. After winning the highest classical honours at his University, Lightfoot became, in 1871, a Canon of St. Paul's and devoted his comprehensive and solid learning, unsurpassed in any theologian of his time, and his vast literary skill, to the defence of Christianity, at its fountain-head in the ancient documents, against the assaults of German criticism.

In Arthur Penrhyn Stanley, Dean of Westminster, who died in July, 1881, the Church lost one of her most liberal-minded and influential divines, whose literary work was even less important than the effect which he wrought on the temper of the Church and the age in spreading the spirit of Christian tolerance and freedom. After a most brilliant career at Oxford as a student, he there became a Fellow and Tutor of University College, and in 1850 was made Canon of Canterbury. Three years later, he was Professor of Ecclesiastical History at Oxford and Canon of Christ Church, and in 1863 was named Dean of Westminster. His marriage, shortly afterwards, with Lady Augusta Bruce, sister of the Earl of Elgin,

sometime Governor-general of India, made the Deanery one of the foremost intellectual, literary, social, and political gathering-places in London. Lady Augusta had been for many years a personal attendant and friend of the Queen, and, taking a great share in all her husband's labours and pursuits, she aided his influence as a leader of the Church and as an accomplished man of the world. There never was a more sturdy and fearless champion of freedom, charity, and toleration. He never looked to party, opinion, or sect, but to ability and character alone, in those whom bigots strove to make the victims of their shibboleths and their narrow-minded dogmatism. His life was a long struggle for a free and comprehensive Church. Denounced as little better than an infidel by the highly "orthodox", he commended Christianity, by his life, by his pen, and from the pulpit of the Abbey, to all who believe that vital religion involves something more than Articles, and rituals, and creeds.

John Frederick Denison Maurice, son of a Unitarian minister, was a student at Trinity College, Cambridge, and became a clergyman of the English Church in 1834. He was one of the broadest and most influential divines of the age, and may be regarded as a founder of the Christian Socialism which seeks good for human beings not in interference with the rights of property, but in the spread of a Christian spirit devoted to righteousness and good works. He disdained party-spirit, and wrought with power on men among all parties. In 1840, he became a Professor at King's College, London, but in 1853 he was driven by bigotry from his position because he had published a work denying the "orthodox" view on eternal punishment for sinners. From 1866 till his death in 1872 Maurice was Professor of Moral Philosophy at Cambridge University. The advance towards freedom of opinion in the Anglican Church, due to the efforts and example and self-sacrifice of Maurice and his school, may be estimated in regard to the very opinion for which he was condemned at King's College. In 1878, Dr. Farrar, a most able scholar and preacher, another product of Trinity College, Cambridge, now (1896) Dean of the Metropolitan Church at Canterbury, published a famous volume of sermons, *Eternal Hope*, in which he strongly supported the views of Maurice. Farrar was at that time a Canon of Westminster and Rector of St. Margaret's Church, but no man dared to assail his position save

with the pen, and his advanced theology was no hindrance to his promotion to archidiaconal honours.

Charles Kingsley, a man nobly distinguished in the literary world of fiction, was a native of Devonshire, the county which he so dearly loved and so grandly described. He took first-class honours in classics at Cambridge in 1842, and became Rector of Eversley, in Hampshire, two years later. As a "Christian Socialist", he greatly aided Maurice in his schemes for improving the material, moral, and religious condition of the working-classes, and so did much to advance philanthropy to the position which it has gained in the latter half of the nineteenth century. In 1860 he was appointed to be Professor of Modern History at Cambridge, a post which he resigned in 1869 on being made Canon of Chester. In 1873, he became Canon of Westminster and died, all too soon, in January, 1875. As the representative of "muscular Christianity", a phrase of his own devising, Kingsley did much to aid the cause of practical religion with the young of ardent and manly character.

Frederick William Robertson, a native of London, died, a middle-aged man, in 1853. He was one of the greatest of English preachers, and one of the noblest Englishmen of his day. After studying at Oxford, he became a Church-minister in 1840, and, after five years' work at Cheltenham among the bigotries of the "Evangelicals", he was appointed, in 1847, incumbent of Trinity Chapel, at Brighton. His personality and power in that position became almost unique in the history of the Anglican Church. As the earnest and sympathetic friend of working men, Robertson was denounced as a revolutionary person, his whole life being, in fact, a "passionate imitation of Christ". The stern foe of all tyranny and wrong, and of moral evil in every form, he was most tolerant and sympathetic in his treatment of intellectual error, and thereby acquired great influence over many who were repelled by the cold orthodox presentments of the Christian system.

The active spirit at work in the Anglican Church has developed its force in various directions. The parochial system has been greatly extended in its operations through modern guilds, societies, or clubs, directed by voluntary workers, all looking to the parish church as their centre, and to the parish clergyman as their head. We may exhibit the energy now at work in redress of social suffering by one example selected from hundreds of such among the great

centres of our teeming population. In one east-end parish of London, with a staff of three ordained clergy and a lay-reader, working amidst people employed in factories and at the docks, we find three "mission-rooms" in outlying parts of the parish, in charge of the clergy and of a Deaconess, with which there are connected a Men's Club, a Factory Girls' Club, a Children's Guild, three Mothers' Meetings, a Sunday Afternoon Bible Class for men, a Temperance Meeting, two "Bands of Hope", and, in the winter months, a Ragged School Sewing Class. The day-schools have 500 learners, earning the highest government grant for efficiency, and the Sunday Schools are attended by about 1000 children. But this by no means exhausts the list of organizations for Christian work in this single parish. There are also Communicants' Classes, a Missionary Association, a branch of the Girls' Friendly Society, a Young Men's Guild, a branch of the Church of England Working Men's Society, a Mothers' Union, a Boys' Club, and a Fathers' Meeting. Assuredly, if such machinery can promote the triumph of religion over evil, there is no lack of its use in these latest years of the nineteenth century. Looking to the character and means of the population in such a district, and taking money-contributions as a fair test of earnestness in religious work, we may find encouragement in the fact that the average annual amount, for five years, collected in the church, rose from £183 in 1881, to £427 in 1892.

One of the most striking features in the later history of religious work is the amount of lay-help now placed, in various forms, at the service of the Church, including the sisterhoods' or deaconesses' institutions, started by Dr. Pusey in 1845. In connection with these numerous and excellent organizations, women have the management of orphanages, industrial schools, penitentiaries for women, convalescent hospitals, schools, sanatoriums, houses of charity for the destitute, mission-houses, depôts for the sale of clothing to the poor, and many other centres of the good work which endeavours "to give to Christianity its lost place in the classes of society which modern civilization has first created, and then trampled under its feet".

The extension of the episcopal system to the British colonies and dependencies is a matter mainly belonging to the Victorian age. In 1837, there were only three Anglican bishops in India, one in each of the Presidency capitals; two in North America, those of

Nova Scotia and Quebec; one in the southern hemisphere, the Bishop of Australia; two in the West Indies, at Barbadoes and Jamaica. The vastly increased number corresponds, of course, to the growth of population in the Colonial empire, and it proves that the Church at home, in the institution of these new dioceses, has had due regard to the children who have been born, or have emigrated, outside the range of her work at home. In 1894, there were 18 dioceses in the Dominion of Canada, 9 in India, Further India, and Ceylon, 7 in New Zealand and dependencies, 14 in Australia, 10 in South Africa, 7 in the West Indies, and 19 in other parts of the world, including about 12 missionary bishops.

The subject of missions to the heathen is far too wide for anything but allusion here, apart from British India, where it is separately treated. Many devoted men of various religious communions in Great Britain have given up the labour of their lives, and have, in some cases, laid down their lives as a sacrifice, to their Master's cause among the heathen. The chief missionary societies in the Anglican Church are the Society for the Propagation of the Gospel, founded in 1701, and the Church Missionary Society, established in 1799. The Nonconformists have the London Missionary Society (founded 1795), the Baptist (1792), and the Wesleyan (1817). The chief associations in the English Church for aiding her work in populous parishes are the Church Pastoral Aid Society, founded in 1836, and the Additional Curates' Society, whose history exactly coincides with that of Victoria's reign. Both of these provide grants of money for the payment of assistant-clergy, and other objects. The Bishop of London's Fund, instituted, as we have seen, by Bishop Tait, in 1863, for the building of churches and providing of additional clergy, has expended nearly a million sterling, and in most of the dioceses of England and Wales there are now special associations for the same objects.

There are two great societies for the spread of Christian knowledge in whose concerns both Churchmen and Nonconformists meet on a common platform. These are the Religious Tract Society and the British and Foreign Bible Society. The first of these was founded in 1799 by Mr. George Burder, a Congregationalist minister, who became secretary to the London Missionary Society. From a lowly beginning the Tract Society rose to a position of vast and influential work. Up to 1891, nearly 3000

millions of books, tracts, and leaflets had been issued, over all quarters of the world, in above 200 different languages and dialects, and in that year the managers had to deal with an income of more than £200,000. Two of its periodicals, the *Sunday at Home* and the *Leisure Hour*, enjoy great popularity. The Bible Society, as to its principle, had its origin in 1780, in an association of that name which was formed for the distribution of Bibles among soldiers and sailors. This body, confining itself to its original object, has done much good work, and still exists as the Naval and Military Bible Society. In 1802, a clergyman from Wales, who had found the want of Welsh Bibles for the use of his people, came to London, and brought the matter under the notice of the Religious Tract Society. A member of the Committee, on this hint, enlisted the aid of Churchmen and Nonconformists, and the great association for the general distribution of the Scriptures, or portions thereof, throughout the world, was the result, accomplished in March 1804. In the first year of its existence, the British and Foreign Bible Society expended the modest sum of £690. The annual income, from legacies, donations, subscriptions, and the sale, at a very cheap rate, of Bibles, New Testaments, and smaller portions of the Scriptures, amounted in 1896 to above a quarter of a million sterling. Over 340 versions of the whole or parts of the Bible have been sent about the world in 298 different languages and dialects, more than thirty versions being in tongues that possessed no previous literature, but were for the first time, with the aid of missionaries working among divers races of heathenism, reduced to a written form. The Bible Society, now having nearly 6000 branches and auxiliary associations in Great Britain and the Colonies, has distributed about 140 millions of copies of the whole or parts of the sacred books of Christianity. The National Bible Society of Scotland, originating in 1809, and the Hibernian Bible Society, founded in 1806, do similar work on a less extensive scale.

The London Young Men's Christian Association, a non-sectarian body of great importance, arose in 1844 among some drapers' assistants in St. Paul's Churchyard, London. There were many like bodies, for the mental and spiritual improvement of young men, existing even before the eighteenth century, but none ever attained the position of this modern society and its fellows and offshoots. The twelve young men who, in June, 1844, met in a room at the

large drapery establishment of Hitchcock, Williams, & Co., were the originators of a very wide-spread movement. In 1855, the Association was well established in buildings at Aldersgate Street, London, and in 1881, at a cost of nearly £60,000 for the freehold building and its adaptation, Exeter Hall, in the Strand, became the headquarters. At, and in connection with, this great Christian club there are gymnasiums, classes for instruction in a wide range of subjects, reading and conversation rooms, a library, Bible classes, devotional meetings, tea and dining-rooms, seaside-homes, baths, employment and apartment registrations, and other agencies useful for objects both secular and sacred. At present, the United Kingdom contains nearly 1300 centres, and the movement has extended through our colonies in all parts of the world. At the jubilee of the Association in 1894, Mr. George Williams, the chief founder of the body, received the honour of knighthood. The Young Women's Christian Association, founded in 1857, had in 1892 about 100,000 members, nearly one-fifth of whom are found in Scotland, and, in London alone, this society possessed 47 institutes, restaurants, and homes, with many smaller branches. By this, and by the Girls' Friendly Society, much is done on behalf of the moral, social, intellectual, and spiritual improvement of a class who, especially in great towns, sorely need religious and secular watchfulness, help, and care.

The ranks of Nonconformity, in the period under review, have furnished many distinguished names, and displayed great activity in warfare against the common foe. We have seen how, in the eighteenth century, the Wesleyans or Methodists rose into a position of great influence among the masses of the people through the neglect of duty by the clergy of the Established Church. In the first three decades of the nineteenth century, prior to the "Anglo-Catholic revival", the activity and efficiency of the Church clergy still left much to be desired, and Nonconformity became organized with great compactness and power among the manufacturing classes of the north of England and the Midlands, and the cause of vital religion owes a deep debt to the work of Dissenters. In England, Wales, and the Protestant quarter of Ireland, the four chief Nonconformist communions are those of the Wesleyans or Methodists, the Independents or Congregationalists, the Baptists, and the Presbyterians, the main body of these last being found in the north

of Ireland. If we include among the Wesleyans the various sects of Methodists, as the New Connection, the Primitive, the United Free Church, and the Welsh Calvinistic, who have either seceded from the main body, or, as in the case of the last-named, arose in the eighteenth century under other influences than Wesley's, they form the most numerous and influential of the Dissenting communities, having over 4000 regular ministers, nearly ten times as many lay-preachers, about 800,000 adult members, nearly 15,000 chapels, and nearly 1¾ million Sunday-scholars. The Wesleyan Methodists, representing the original body founded by Wesley, have four theological colleges for the training of ministers, many secondary schools, and about 900 day-schools, with nearly 200,000 scholars, and an annual income of a quarter of a million. The cause is supported by the millions of publications annually issued from the Methodist Book-room in London, by four quarterly magazines, and by about 150 newspapers in English and other languages. Amongst the eminent Wesleyan pulpit-orators of the Victorian age the most distinguished and popular was Mr. Morley Punshon.

The Independents or Congregationalists, who rose to importance under the Commonwealth, derive their names from the fact that the government of each congregation, or separate body of worshippers, is not dependent on any external authority, but is in the hands of the members themselves. Their strength lies chiefly in the great towns of England, and has been largely increased since 1833 by the formation of the Congregational Union of England and Wales, whereby a large number of churches, or congregations, agreed to adopt a common line of action, without any interference with the separate bodies. Two great annual meetings are held, one in London, the other in some important provincial town. This vigorous Nonconformist body have, in the British Isles, nearly 5000 churches and preaching-stations, with about 3000 regular ministers and some 300 "evangelists", and they annually raise more than a million sterling for religious and charitable purposes. There are about a dozen colleges and institutes for the training of ministers, including Mansfield College at Oxford, founded in 1886 by the transference of Springhill College and its revenues from Birmingham. The Congregationalist ministers are distinguished by their enlightened spirit and culture, trained as they are to scholarly methods, and

competent to deal with theology on both its historical and speculative sides. Apart from able living preachers, the body has produced, during the nineteenth century, eminent pulpit-orators in Dr. Binney, a native of Newcastle-on-Tyne, who settled in London in 1829, and became very popular as the minister of the Weigh-house Chapel, near London Bridge, where he laboured with great success until his retirement in 1869; and in John Angell James, born in Dorsetshire in 1785, who, at twenty years of age, became minister of the congregation meeting in Carr's Lane, Birmingham, and remained there, with ever-growing influence and fame, until his death in 1859. He won high esteem not only in his own religious body, but among the Evangelical or Low Church party in the Establishment, and dissenters generally in the British Isles and America.

The Baptists, in all their ramifications, form a body scarcely inferior in importance to either of the above. They first became prominent in later Stuart times, when they had the glory of producing John Bunyan. In 1832, most of their sects were included in the Baptist Union. Their form of church-government resembles that of the Independents, and they have, in the British Isles, nearly 4000 chapels, with above 300,000 regular members, besides numerous other attendants at worship. For the training of ministers, there are ten excellent colleges and theological institutes. The Baptists have been, from an early period, distinguished for work in the missionary field in all parts of the heathen world, their special society for this enterprise having been instituted in 1792. In the Victorian age, their communion can boast of a man of the highest distinction in Charles Haddon Spurgeon, born at Kelvedon, in Essex, in 1834, who became, at nineteen years of age, minister of a chapel at Southwark, in London, and was installed, in 1861, at the famous Metropolitan Tabernacle, near Newington Causeway, where he regularly officiated, until his death in 1892, to a congregation of about 6000 persons. His admirable gifts of voice and exposition, with a clear, bold, simple, direct, and humorous style, made him the greatest Nonconformist preacher of his time, heard by eager visitors from all classes of society and all parts of the world. He was as conspicuous for disinterested charity, zeal, active benevolence, and organizing and administrative power as for ability in the pulpit, and the Tabernacle, under his charge, became the centre of many important institutions, including the

Pastor's College, Almshouses, and the Stockwell Orphanage. Testimonials to the amount of £11,000 were presented to him by his congregation in 1879 and 1884, and every penny was at once transferred to the funds of his charitable schemes. It is interesting to note that, in his youthful days, Spurgeon was a member of the Baptist Church at Cambridge, which had been, in the latest years of the eighteenth century, and the opening years of the nineteenth, presided over by the illustrious Robert Hall, a man of the very first rank in British oratory, whom we have met in connection with the death of the Princess Charlotte. No man's sermons ever had readers approaching in number those of Mr. Spurgeon's printed discourses. They were taken down in shorthand from his wholly extemporaneous utterance, and, after careful revision by himself, had an average weekly circulation of 30,000, rising, in some cases, to nearly seven times that amount. They have been translated into nearly all the European languages. The mental activity and productive power of this wonderful, and, in spite of a narrow theological creed and much bigotry of speech, if not of feeling, this noble specimen of an Englishman, may be judged by the fact that, in addition to his weekly sermons and a monthly magazine, he put forth above a hundred volumes, including a masterly commentary on the Psalms, the *Treasury of David*, in 7 vols., published after more than twenty years of labour at intervals.

The Presbyterians, in England, have not been a prominent body since the seventeenth century, having been overshadowed by the Independents, and then by the Baptists and Wesleyans. In 1876, when the "Presbyterian Church of England" was formed by union of English Presbyterians connected with the United Presbyterian Church, and with the Free Church, of Scotland, there were about 250 congregations or churches in the country, and about 20 in communion with the Established Church of Scotland. Leaving the Scottish Churches for a separate notice, we observe that the Presbyterians in Ireland, originating in the Ulster settlement made by Scottish colonists, under James the First, numbered about 450,000 in 1891, and had two colleges, at Belfast and Londonderry, for the training of ministers and for general education. It is to be noted, in order to render justice to British Nonconformists, that they, of later years, have developed in great vigour parochial organizations resembling those of the Established

Church. As an example, we know of a Congregational church in a great North London parish which has around it, supported by funds contributed from the worshippers, a Benevolent Society, a Dorcas Society, a Maternity Society, a Ministers' Aid Society, a Penny Bank, a Tract Society, a Sunday-school with 700 learners, a "Band of Hope" or Temperance Society for the young, with branches of several missionary societies, and two groups of branch institutions, with chapels, missionaries, ragged schools, and other benevolent agencies, maintained in the crowded and impoverished East End of the Metropolis.

In Scotland, the headquarters of Presbyterianism, the Church of Scotland, or Established Church, has about 1330 parishes, besides 321 endowed churches, preaching-stations, and mission-stations, and nearly 600,000 communicants. Since 1872, nearly five millions sterling have been collected for religious and charitable purposes. Much good influence was wrought by the abolition, in 1874, of the vicious system of private patronage which caused the disruption of 1843. Among the eminent men produced by this section of Scottish Christianity in the nineteenth century has been the eloquent and broad-minded Norman Macleod, born at Campbeltown, Argyleshire, in 1812, and minister of the Barony Church, Glasgow, from 1851 till his death in 1872. He was widely popular in England as editor of, and writer in, the admirable serial *Good Words*, and he enjoyed the Queen's special favour, as one of her chaplains in Scotland, for the value of his sermons, his sympathy, and his counsel. Dr. Robert Lee, born at Tweedmouth in 1804, and minister of the Old Greyfriars Church, Edinburgh, from 1853 till his illness in 1867, was another man of liberal views, who suffered bitter persecution for years from the bigots of the Establishment because he sought to brighten the church-service, and to increase outward reverence of worship, in the introduction of the organ, the use of printed forms of prayer, the kneeling attitude in prayer, and the standing posture in singing. Since his day, much reform has come in church-buildings and church-ritual. Dr. Tulloch, born in Perthshire in 1823, became a Professor of Divinity at St. Andrews in 1854, senior Principal there in 1860, and Moderator of the General Assembly in 1878. A voluminous essayist and general author of eminent ability, he was a fearless, large-hearted, earnest, broadly-cultured, and sympathetic man,

whose noble personality and power of speech corresponded with his moral and spiritual character.

The United Presbyterian Church of Scotland was formed in 1847 by a junction of the Secession Church of 1733 with the Relief Church of 1752, two schisms caused by the tyrannical action of the law of patronage, disregarding the wishes of congregations in the appointment of ministers. The distinguishing feature of this branch of the Scottish Presbyterians is the voluntary principle which sets itself against all state-establishment of religion and all public and national endowments for the maintenance of Christianity. Their congregations number nearly 600, with nearly 200,000 members. This Church has enjoyed great prosperity, and their Declaration Act of 1879 rendered service to true religion by practically superseding the harsher theology of the standards of faith, the Westminster Confession and the Longer and Shorter Catechisms.

The zealous and active Free Church, greatly benefited by its adoption, at birth, of the principle of self-support, has its history of half-a-century marked by some of the most eminent men in Scotland. The illustrious Chalmers, born at Anstruther, in Fife, in 1780, was first distinguished in mathematics and natural philosophy at St. Andrews, and then, as a preacher of the first order, at the Tron Church, Glasgow. He gained a great reputation in London pulpits, and then returned to Glasgow, and, as minister of St. John's parish, displayed high administrative ability in organizing spiritual and bodily relief for a vast and neglected population. His health was partially broken by incessant toil, and in 1824 he became Professor of Theology at New College, Edinburgh, earning high reputation at home and abroad by his philosophical writings on various topics. We have seen the part which he played in connection with the foundation of the Free Church. The sudden death of Chalmers, at Morningside, Edinburgh, in 1847, was a loss not only to his country but to Christendom. Dr. Candlish, born at Edinburgh in 1806, became minister of St. George's Church there in 1854, and won rapid fame by his powerful and intellectual discourses. He was one of the chief assistants of Chalmers in organizing and consolidating the Free Church, of which he was the leading man from 1847 until his death in 1873. He was Moderator of the Assembly in 1861,

and took a great part in all questions connected with the Church, especially in regard to public education. The late Dr. Robertson Smith, born in Aberdeenshire in 1846, was a brilliant student at Aberdeen, and became in 1870 Professor of Hebrew and Old Testament Exegesis (or Exposition) in the Free Church College of the same city. His articles on the Bible and cognate subjects in the ninth edition of the *Encyclopaedia Britannica* were reported by a committee of examination, appointed by the Free Church Assembly, to have caused "alarm" and "anxiety" by their "dangerous and unsettling tendency". The distinguished author was thereupon prosecuted for "heresy" before the Free Church Presbytery of Aberdeen, and a long trial, in which the accused man showed great power in debate and controversy, ended in his acquittal, in 1880, by the narrow majority of 7 in a body of nearly 600 members. In 1881 he was removed from his chair, and in 1887, on the death of Professor Baynes, he took charge, as sole editor, of the current edition of the *Encyclopaedia Britannica.* This eminent man, one of the greatest of Orientalists and critics, was till April, 1894, one of the Professors of Arabic at Cambridge University. His treatment by Scottish bigots was England's gain, and there is reason to believe that the long discussion which took place had rather a widening than a narrowing effect upon Free Church theology. Dr. Guthrie, born at Brechin, in Forfarshire, in 1803, became minister, in 1837, of the Old Greyfriars parish in Edinburgh. Eminent both for pulpit eloquence and as a philanthropist working amongst a degraded population in one of the worst quarters of the Scottish capital, he seceded with Chalmers and his associates, and became in 1843 minister of the St. John's Free Church, Edinburgh. In 1845–6, his advocacy of the new cause throughout Scotland raised, in less than twelve months, nearly £120,000 for the erection of ministers' houses, or manses. In later years, he was a great apostle of the Ragged School system, and was most active and zealous in behalf of temperance and of national and compulsory education. Full of generous sympathy for improvement and progress of every kind, a master of pathetic eloquence, rich in varied illustration, Guthrie was an honour to the Free Church and to Scotland

The "Salvation Army", for novelty, scope, originality and force, is one of the most remarkable religious movements and

organizations of the nineteenth century. Its founder, in 1865, was Mr. William Booth, born at Nottingham in 1829, and from 1850 to 1861 a minister of the Methodist New Connection. A zealous evangelist, he conceived the idea of his highly-practical and aggressive scheme while he was engaged in mission-work among the heathenism of East-End London. His power of organization and enthusiastic devotion to the work of saving souls were admirably aided by his wife, and the body which they started on a military basis, with Booth as the "general", and the sole controller of the funds, received the name of "Salvation Army" in 1878. Public attention was strongly aroused, and the success which was attained quickly assumed enormous proportions. In 1892, there were about 4300 corps, including "outposts", or bodies of tentative workers in new districts, with nearly 11,000 officers, engaged in thirty-five countries, spread over the world. Of these, about 4500 officers direct the movement in the British Isles, where, as in every country, the land is divided into districts, with one or more corps in every large town and many of the larger villages, conducting services in the streets and in buildings, enlisting recruits, and engaging attention by processions with bands and banners in martial array. The whole of the expenses are defrayed by voluntary contributions, and while strict discipline is maintained in matters of principle and real importance, the conductors of the warfare against sin are allowed abundant freedom in details. Marriage between members is solemnized "under the Flag", with vows to dedicate themselves to the service, and children are devoted from infancy to the war by solemn pledges in face of the people. No brutality of "roughs", pelting the processions with mud and stones, no interference of the law against "obstruction" in the streets, checks the ardour of the Salvation soldiers. In many instances, they have endured imprisonment, at the instance of the police, on behalf of the cause, and no violence provokes retaliation on assailants. The religious teaching is, in the main, that of what is known as "orthodox Dissent"; the preaching is characterized by brief, vigorous speech, and stirring appeal; the hymns are hearty choruses to the liveliest of tunes. The *War Cry* and other publications of the Army have a total circulation, in all countries, of about four millions per month. All members are total abstainers from intoxicating liquors, and it is in this direction that there are the most plainly visible signs of good

effected by methods of warfare against evil which, in some respects, have been offensive to the good taste of easy-going, "respectable" Christians. The Salvation Army, however, cares nothing for criticism, and is wholly devoted to the work of saving souls by any and every means that presents itself of awakening sinners to a sense of their condition. The services of women are fully utilized, on a perfect equality with the men, and the position of officers of both sexes is settled entirely by their mental ability and spiritual fitness for the work. In every year, a special week of self-denial sets apart extra funds for the support of the cause, the contributions of the members, almost all poor persons, amounting in one year, from this source alone, to about £40,000.

The Roman Catholic Church in England has, since 1850, been organized with a regular hierarchy presiding over fourteen dioceses, under the Archbishop of Westminster. This interesting relic of bygone days, so far as this country is concerned, numbered about 1½ millions of adherents in England and Wales, in 1891. Some of our oldest noble houses, notably that of the Dukes of Norfolk, are represented, and of late years there have been many recruits, as the Marquis of Bute and the Marquis of Ripon, from among the higher classes of the community. The Roman Catholics have not, however, increased in proportion to the population, and the numbers have, practically, remained almost the same for many years. There has been a large increase in the number of monasteries and nunneries, partly due to the expulsion of Jesuits and other religious orders from Germany, Italy, and France. In Scotland, the "Catholics", as they call themselves, have increased largely of late years, chiefly from the influx of Irish people. The Church there has two archbishops and four bishops, with about 360,000 members. The most eminent members of the Catholic hierarchy in Great Britain, during the Victorian period, have been Cardinals Wiseman, Newman, and Manning. Wiseman, who became Archbishop of Westminster in 1850, was born at Seville in 1802, of an Irish family, and educated first in England, at Ushaw College, near Durham, and then in the English College at Rome. He came to England some years after his ordination, and in 1840 was a Vicar-apostolic of the Central District, before the establishment of dioceses in this country. An accomplished scholar, orator, and writer, Wiseman gained high esteem in Eng-

land long before his death in 1865. John Henry Newman, the leader of the Oxford Tractarian movement already described, joined the Roman Catholic Church in 1845, and was made a cardinal by Pope Leo XIII. in 1879. Born in London in 1801, and trained in the Evangelical school of the English Church by a mother of Huguenot origin, he passed, at Oxford, through the various mental phases described by himself, to his haven of spiritual rest in the olden Church, becoming in 1849 the establisher, under a brief from the Pope, of a religious house called the Oratory, at Edgbaston, near Birmingham, where his lectures on *Anglican Difficulties* gave proof of his great literary ability in the ironical and delicate style. He was one of the finest preachers of his time, and a poet of considerable power, as shown in his *Dream of Gerontius*. Henry Edward Manning, born in 1808 in Hertfordshire, and educated at Harrow and at Balliol College, Oxford, where he took a double first-class in honours, soon became known as an eloquent preacher and a leader of the Tractarian party. In 1840 he became Archdeacon of Chichester in the Anglican Church, but in 1851 he seceded to the Roman communion, succeeding Wiseman as Archbishop of Westminster in 1865. He strongly supported the dogma of papal infallibility at the famous Council of 1870, and was rewarded by Pope Pius IX., in 1875, with a cardinal's hat. During his episcopal career, closing with his death in 1892, Manning, the most influential man among the Ultramontane, or advanced Catholic party, in England, was nobly distinguished by his zealous attention to social and philanthropic questions, especially that of total abstinence, to the support of which and other good causes he devoted the powers of an accomplished man of the world and the wisdom of a practical reformer, and freely associated on platforms, and as a member of royal commissions, with men of other religious creeds.

CHAPTER XII.

HUMANITY AND PHILANTHROPY.

Condition of women and children employed in factories and coal-pits—Agitation for reform—Labours of Lord Shaftesbury—Acts passed for limiting hours of labour, &c.—Government inspectors appointed—Employers' Liability Act—Ragged schools extended—The Shoeblack Brigade—Improved dwellings for the poor—Mr. George Peabody and Lord Iveagh—Efforts on behalf of prisoners—Elizabeth Fry and Thomas Wright—Labours of Dr. Barnardo—Societies for prevention of cruelty to children—Dr. Andrew Reed and the Orphan and Infant Asylums—Asylums for idiots—Hospitals, infirmaries, and dispensaries—Other charitable institutions—"General" Booth's work—Abolition of cruel punishments—Benevolent treatment of the insane—Work of ambulance societies—The Peace Society and arbitration—The Kyrle Society—Mr. Plimsoll's efforts on behalf of seamen—Notable philanthropists of the century—The Royal Humane Society—The Albert Medal.

In no respect has greater progress been made in the British Empire during the period that has elapsed since the year 1801 than in the practical Christianity which serves the Creator by kindly regard for the wants and sufferings of our fellow-creatures. Volumes would be needed for an adequate exposition of the evils thus dealt with by legislation and by voluntary effort, and we can only select for brief treatment a few of the chief reforms that have been accomplished or are still in progress. We take up first the mischiefs and the remedial laws connected with the working of factories and coal-mines, a subject wherein we shall see a hateful development of inhumanity due to commercial competition and greed, and a cheering display of energy and determination on the part of those who were the lovers of their kind. At the present day, Great Britain is distinguished, far beyond all the other great manufacturing countries of the world, by the extent and efficiency of the legislation which deals with economical evils of this class. The change in the manufacturing system of the country which has been already described as a result of the invention of steam-machinery was so complete that, at the close of the great war, in 1815, the workers, instead of spinning and weaving in their cottages, were herded together in factories, owned by men who, from the labour of others, had acquired a vast and ever-growing capital. In the absence of the legalized combination which enabled the creators of wealth to cope with those who grasped the lion's share, the employed were at the mercy of the

employers, who did not, in most cases, fail to take full and cruel advantage of the position. Toilers of both sexes and of all ages were gathered in huge buildings, and, left without arrangements for securing comfort, decency, and health, they were also subject to the increased bodily strain of being forced to work at the pace of the machines, and for the hours during which the owner of the machines, intent only on making money, chose to keep them going with their incessant clatter and whirl. Human beings were thus made into the slaves of things compounded of wood and iron, driven by steam, at the will of men who, in too many cases, had little or no regard for human souls and bodies.

In the early days of the factory-system, parents who were accustomed to the home-method of fabrication, where father, mother, and children worked together, strongly objected to exposing their sons and daughters to the factory life, but sore need, as men's wages fell, at last drove children to the mills. A white slavery began, conducted by wealthy men who denounced the cruelties of American bondage, and posed as philanthropists and religious leaders, ever ready with subscriptions to the cause of Christian missions. The work of the young was eagerly sought by the millowners, because it was cheap, and could, for many purposes, be more conveniently used than that of adults, and their object was served by recourse to the apprentice-system in parishes based upon the old Elizabethan poor-law. Thousands of children were obtained from the workhouses in all parts of the country, by application to the overseers of the poor, and being transported by wagons or canal-boats to the manufacturing districts, were consigned to the charge of overlookers at the mills, who often treated them with great brutality, which included monstrously excessive hours of labour, flogging, fettering, and semi-starvation. It is a fact that children of tender age were often worked for sixteen hours of the twenty-four, and that, in brisk times for trade, the beds of these sufferers were never cool, as the mills were working day and night, and when one set of children rose for labour, the other set retired to rest. Decency compels us to throw a veil over the worst physical and moral results of this life of toil in abodes of vice, disease, and premature death. It must be remembered, when we desire to understand the enormous changes wrought during the reign of Queen Victoria, that the evils we are describing had been

scarcely touched by legislation when she came to the throne. When the wretched victims of the millowners tried to run away, boys and girls were forced to work with irons on their ankles, connected with chains that reached to the hips, and in these they were also compelled to sleep. There were many instances of what the law, if it had been evoked, would have called, at the least, manslaughter; there were many who escaped from their bonds by suicide.

In the coal-mines, boys and girls of six years of age were set to work for twelve hours a day, opening doors for the coal-trucks to pass through. Their labour was performed in the dark, with blows for neglect or for sleep due to utter weariness of body. In the winter season, these hapless children saw no daylight at all. Their hours of work were from 4 a.m. to 4 p.m., and they only reached the upper air by the "cage" when the sun had vanished below the horizon. When these youthful toilers underground were a little older, they were promoted to the position of "drawers", dragging trucks by means of a belt round their waists, attached to a chain which was fastened to the truck. Boys and girls alike wore nothing but trousers. Others pushed the trucks along with head and hands, and the loathsome picture is completed by the sight of trouser-clad women, bare to the waist, working as colliers side by side with the men. Repulsive, terrible, but perfectly true are these details of human labour in this Christian land, before men with warm hearts, cool heads, and potent tongues brought public opinion and a Laodicean legislature to active interference with these industrial wrongs.

One of the earliest of these social reformers was Robert Owen, a native of Montgomeryshire, who married, in 1799, the daughter of David Dale, proprietor of the famous cotton-mills at New Lanark, near the Falls of Clyde, and became manager and part-owner of that flourishing concern on its sale to a Manchester company. Owen zealously laboured to teach his workpeople the benefits of good order, cleanliness, and thrift; he abolished at the mills the employment of pauper children, and about 1813 he threw himself with great energy into the factory controversy, and, collecting evidence in special journeys through England and Scotland, proved that large numbers of young children were crippled and permanently injured by excessive toil and other ill-treatment in the mills. His efforts to obtain effective legislation failed, but the

attention which he drew to the subject caused the appointment, by the House of Commons, of a committee of inquiry, in furtherance of the principle of a very restricted Act of 1802, passed in behalf of the "Health and morals of apprentices and others employed in Cotton and other Factories". The next champion of the workers was Mr. Richard Oastler, of Fixby Hall, Huddersfield, in the West Riding of Yorkshire, a land-agent of great ability whose attention was turned to the cause of the factory children by the philanthropic John Wood, of Bradford, a wealthy worsted manufacturer. Oastler was appalled by what he now learned, and he gave himself up—heart, soul, position, leisure, fortune—to the crusade against wrong. His letter in the *Leeds Mercury*, in October, 1830, headed "Yorkshire Slavery", marks an epoch in the history of the great question, which Oastler thus, for the first time, made widely popular. The Duke of Sussex took the matter up in London, and it became one of sustained and vigorous debate in public and private, in print and speech. In the West Riding and in South Lancashire the agitation soon attained great dimensions, and an earnest parliamentary advocate was found in Mr. M. T. Sadler, of Leeds, M.P. for Newark. In 1832, he proposed a ten-hours limit for factory labour, but his only success was in having the matter referred to a Select Committee, and he soon afterwards lost his seat, on a dissolution.

A new leader was at once found in the foremost British philanthropist of his own or of any time, the great and good man then known as Lord Ashley, who became, on his father's death in 1851, the seventh Earl of Shaftesbury, by which title, if renown be commensurate with human merit, he will be known to the most distant posterity. He had known nothing of the question until the Rev. G. S. Bull, a philanthropic clergyman of the English Church, and a friend of Oastler's, urged him to assume Sadler's vacant place in the Factory controversy. Lord Ashley, returned as M.P. for Dorsetshire in 1833, in his thirty-second year, had obtained first-class honours in classics at Oxford University, and had entered the House of Commons, as an independent Tory, in 1826. We learn from himself that he regarded Mr. Bull's proposal, at first, with "astonishment, and doubt, and terror", but, after one night's consideration, his choice was made. In his biographer Mr. Hodder's words, "He now stood at the parting of the ways. On the one

hand lay ease, influence, promotion, and troops of friends; on the other, unceasing labour amidst every kind of opposition; perpetual worry and anxiety; estrangement of friends, annihilation of leisure, and a life among the poor." The nobler course, as all the world knows, was the decision taken, and, as a matter of fact, renouncing "society" and all amusements, he gave up more than fifty years of life to schemes of beneficence, and exhausted his time and his strength in correspondence, interviews, speeches, and chairmanships in connection with religious and benevolent institutions of every kind. After collecting evidence concerning the treatment of the young in factories which sent a thrill of horror through the length and breadth of the land, expressed in verse, at a later day, by Elizabeth Barrett Browning, in her powerful and pathetic *Cry of the Children*, Lord Ashley brought forward, in 1833, a Bill which he abandoned through its treatment in Committee. A Government measure, Lord Althorp's Act, passed in 1834, made some improvement in favour of securing a moderate degree of education for the young toilers in the mills, by working them on a system of relays. In 1838 and 1839, Ten Hours Bills were defeated in the Commons, but in 1840 Lord Ashley secured the appointment of a Royal Commission for inquiry into the employment of women and children in factories and mines. The report proclaimed facts of the most painful and disgraceful nature, both in a physical and a moral sense. In 1844, an Act was passed which provided that no child under eight years of age should work in a factory; that due time should be allowed for meals and school-attendance; and that labour should cease at 4.30 on Saturdays. In 1846, the Ten Hours Bill, introduced by Lord Ashley, supported by Lord John Russell, Macaulay, and Sir Robert Peel, and opposed by Cobden, Bright, Joseph Hume, and Roebuck, was again defeated, by a majority of ten. Lord Ashley had now lost his seat for Dorsetshire, in consequence of his support of Corn Law abolition, and the question was then, for a time, in the hands of Mr. John Fielden, a great cotton-spinner, who had himself worked as a boy in his father's mill, and, being perfectly conversant with all points of the question, had strongly advocated factory-reform both in and outside of the House of Commons. At last, in 1847, Mr. Fielden's Bill, for ten hours' work per day, or fifty-eight per week, with the partial holiday on Saturdays,

passed both Houses and became the law of the land. The law was, however, greatly impeded in operation by legal intricacies, and mill-owners evaded the vigilance of factory-inspectors by ingenious devices. Subsequent Acts, down to and including 1871, gave efficiency to previous legislation, and extended protection for workers of all ages to many modes of industry besides those pursued in the great textile factories. Bleaching and dyeing works, brickfields, workshops in many industries, bakehouses, were all invaded by government inspectors, enforcing enactments on behalf of the employed. In 1842, all women, and boys under thirteen, had ceased to work in the coal-mines, and in the same year, mainly through Lord Ashley's benevolent exertions, the cruelties practised on young chimney-sweeps had come to an end by legislation that forbade any person under the age of twenty-one to ascend or descend a chimney or enter a flue for the purpose of cleansing it. Since 1871, various statutes dealing with factories, workshops, and mines have done very much to secure safety, comfort, health, and, in the case of children, time for education, for all the wage-earners. The Act of 1878 was a crowning piece of legislation for their benefit, and now an army of inspectors, in whose ranks ladies have been lately (in 1893) enrolled, and who are possessed of large powers, attend to cleanliness and ventilation, the fencing of machinery, the hours of work, the exclusion of young persons from dangerous and unwholesome occupations needing special precaution, and many other points which nearly concern the welfare of artisans of every class. Apprentices and hired servants, the workers in coal-mines, the women and children living on canal-boats, children employed in theatres, have all, by the searching benevolence of the Victorian age, been brought under the powerful protection of the law. The inspection of coal-mines has had the effect of reducing the ratio of deaths, per thousand of those therein employed, from about four per annum, in the years from 1851 to 1860, to less than half the amount. The Employers' Liability Act of 1880 favoured the interests of workmen in making masters liable to pay them compensation for injuries received, during employment, through the negligence of those to whom the employer's authority had been delegated.

One of Lord Shaftesbury's chief titles to fame as a social reformer —the steadfast friend of the poor, the degraded, and the outcast—

rests upon his wise, benevolent, and long-continued labours in establishing and fostering Ragged Schools, now (1894), as regards the Ragged School Union of London, in their year of jubilee. In 1845, he became president of the London movement for rescuing the children of the slums, in laying hold of the waifs and strays of dangerous and disreputable courts and alleys, reeking with moral and physical abominations, where they were being surely trained for a life of crime. The idea was not new, but only the scale on which it was now carried out. In the earlier decades of the century, good John Pounds of Portsmouth, a poor shoemaker, who died in 1839, had for twenty years gathered round him the ragged children of his district, tempting them to come by little gifts of cakes and fruit, and teaching them to read as he worked at his last. His admirable example was followed in Portsmouth with much success. In 1838 there was a "Ragged Sunday-School" in London, and the Field-lane Ragged School, which gained Lord Ashley's attention, was opened in 1843. In Aberdeen and Edinburgh there were like institutions, and Dr. Guthrie's *Plea for Ragged Schools* exerted an immense influence. That excellent philanthropist, Miss Mary Carpenter, born in 1807, daughter of Dr. Carpenter, an Unitarian minister at Exeter, opened a school of this class, in 1846, in one of the worst parts of Bristol, and also founded reformatories for petty criminals among boys and girls. Ragged Schools were soon spread throughout the country, for the benefit of the juvenile outcasts in every large town. In 1846, Lord Ashley, as he still was, exposed in the *Quarterly Review* the perilous and disgraceful state of things, in the poorest and most crowded quarters of the metropolis, which was indicated by the arrest, in 1845, within the boundaries of London, of nearly 15,000 persons under twenty years of age. There were soon 10,000 children in the metropolitan schools of this class, and in 1883 Lord Shaftesbury was able to claim that 300,000 boys and girls had been picked up from the streets, and, in most cases, turned into good citizens, working in trade and in domestic service in England and the colonies.

The boys of the Shoeblack Brigade, with their uniforms of blue, picked out with red, are a familiar sight to all dwellers in and visitors to London. Started in 1851, when the first Great Exhibition brought to London so large an influx of foreigners and provincial British, the lads of the bottle and brush supplied a

manifest want and won a genuine success. In thirty years' time, the members exceeded 300, earning £12,000 in the year. Thousands of boys were thus rescued from poverty and placed in good situations. The warmest friend and staunchest supporter of the shoeblacks was Lord Shaftesbury, with whom they regularly took tea at their annual gathering in Exeter Hall. The care and reformation of juvenile offenders also engaged his deep interest, and Charles Dickens, a good judge of such matters, praised Lord Shaftesbury's Common Lodging-House Act as one of the best measures that ever came forth from Parliament.

The subject of improved dwellings for the poor is a very wide and important one, closely connected with sanitary reform as well as with philanthropy, and one never yet adequately dealt with by legislation or by voluntary effort, either in the way of benevolence or of commercial enterprise. In both these latter points, some noble examples have been given, and those examples have, to some extent, been followed. In 1862 and later years, Mr. George Peabody, a native of Massachusetts, who settled in London in 1837 as a merchant and money-broker, and acquired enormous wealth, placed half-a-million sterling in the hands of trustees to be used in erecting a better class of houses in London for the artisan class. The blocks of "Peabody buildings" in various parts of London are the fruit of this princely munificence, and, as they are let at rents that not only provide for maintenance, but give an annual profit, there is an ever-growing fund for the extension of the benefit in the form of new buildings. In 1867, after proof of the fair dividend on expended capital earned by the earlier blocks of Peabody Buildings, the Artisans', Labourers', and General Dwellings Company was formed for the purpose of providing homes for a population evicted by metropolitan railway-extension, and of enabling workmen to become owners of good and cheap houses, fitted with the latest sanitary appliances. In August, 1872, Lord Shaftesbury laid the first stone of a new town for artisans and clerks on the land called the Shaftesbury Park Estate, near the world-known Clapham-Junction Station. The buildings, 1200 houses, with room for about 8000 persons, were opened in 1874, with schools, a public garden, a lecture-hall, and co-operative stores, but with no pawn-shop or public-house allowed within the precincts. Several other house-building enterprises, on the benevolent basis of seeking no profit,

but only the cost of maintenance, have recently been started in London, and in 1889 the great Dublin brewer, Sir Edward Guinness, afterwards created Lord Iveagh, placed ¼ of a million sterling in charge of trustees for the provision of sanitary dwellings for workmen at a low rent in London and Dublin, the income, after deducting cost of maintenance, to be employed, as in the case of the Peabody Trust, on the extension of the same benevolent scheme. We may here state that, at his death in 1885, Lord Shaftesbury was the president, or vice-president, or patron, of about forty distinct charitable institutions or associations—hospitals, asylums, societies, unions, dispensaries, charities, and infirmaries, for children, well and sick, for flower-girls, women, the blind, the lame and deformed, orphans, distressed foreigners, domestic servants, governesses, and cabdrivers.

A noble form of practical Christianity is that which devotes time and trouble to prisoners under punishment for crime. The changed methods of official dealing with criminals will be treated in a coming chapter, and we here notice only some distinguished voluntary efforts in that direction. In the earlier days of the nineteenth century, Mrs. Elizabeth Fry, a warm-hearted woman, full of sympathy and tact, highly intelligent, and gifted with a charming manner for her difficult work, became widely known as a prison-reformer. A daughter of Mr. John Gurney, a Norwich banker, and a member of the Society of Friends, or Quakers, a sect ever prominent in good works, she married a "City man", Mr. Joseph Fry, and from 1809 lived at Plashet, near Barking, in Essex. She had already worked much among the poor, and managed a school of poor children, founded by herself, with more than seventy scholars. In 1813, visiting Newgate prison, in London, she saw 300 women, convicted and awaiting trial, with their numerous children, living in idleness, rags, disorder, misery, and dirt. In a few years, by persistent efforts, she set up a school and a manufactory within the walls, and formed a Ladies' Association for the improvement of the female prisoners, with a matron to supervise them, and regular religious instruction. Mrs. Fry, devoted to prison-reform as the work of her life, visited many jails in Great Britain and on the Continent, and laboured at improving the discipline and direction of affairs, until her death in 1845. Another notable prison-philanthropist was Thomas Wright, a native of Scotland, who became,

about 1820, a foreman at a foundry in Manchester. Visiting the Borough Jail, he was moved with pity for the condition of prisoners who had, on release, no homes to go to, and no prospect but a return to evil ways. After procuring the restoration to his work, in another department of the foundry, of a well-conducted man who had been dismissed solely because it was found that he had been a convict, Wright was allowed to attend the Sunday services at the prison chapel, so as to make his face familiar to the inmates. Then, when the hour of release came, he managed, by leave of his own employers, to meet them at the prison door, and, winning their confidence, he was able, through the help of his fellow-townsmen, in many cases to procure for them honest employment. The prison-chaplain was greatly struck by the result of Wright's exertions, and the authorities gave him permission to enter the prison at his will. The people of Manchester at last resolved to enable the social reformer to devote his whole time to the excellent work which pure benevolence had led him to undertake. A subscription was opened, the Queen became a donor, and an annuity of £200 was secured. Wright then visited the chief prisons in the kingdom, and the Government offered him a post as official inspector, at a salary rising from £300 to £500 a-year. This was declined, as likely to spoil his powers of persuasion with the convicts, and the old course was pursued, whereby, in many instances, husbands and wives, parents and children, masters and workmen, were reconciled after estrangements caused by criminal conduct. In one case, a Portland prisoner, released from penal servitude by ticket-of-leave, obtained employment, through Wright, as a scavenger. He then became a road-mender, an attendant at Sunday and night schools, a teacher in the schools, and finally a clergyman of the Established Church. In another case Wright procured, from a Manchester merchant, first a promise not to prosecute, and then a re-employment for a young man guilty of embezzling money. The man became first a partner in, and then the head of, the firm, and was a most liberal supporter of the pious enterprises of the man who had saved him from ruin. Comment would but mar the effect produced upon the mind by the simple and true account of Thomas Wright's career. In 1880, he was yet alive, over ninety years of age. In 1894, there were in London two Discharged Prisoners' Aid Societies, which pursue with success the course marked out by him.

Work of a truly benevolent character is that performed by Dr. Barnardo, who began, in 1866, to devote time and trouble to the hapless case of homeless children in the streets of the metropolis, as they were found by him resting at night in the corners of courts and alleys, or under archways and in sheds. Enlisting the aid of philanthropic persons able to contribute to the expenses of his scheme, Barnardo founded, at the East End of London, the Homes in which boys and girls are trained for useful work in life. Energy in gathering funds, and skilful use thereof in organization, have enabled the good Doctor to rescue many thousands of children from want and misery, leading them surely to a life of crime, and to start them on careers of honourable labour from his many institutions in the United Kingdom and the Canadian Colonies. Need of succour, and utter destitution, are the only credentials required for introduction to the hospital for sick children, or the home for babies, or the workshops, of this excellent benefactor of the most helpless of human beings. Up to the present time, Dr. Barnardo has sent out 8500 boys and girls to the Colonies, of whom 98 per cent have turned out well.

We have seen how legislation has stretched out a long and powerful arm for the defence of children from the wrongs once inflicted through the carelessness and cruelty of commercial greed, wrongs which were, until a time beyond the middle of the nineteenth century, a bitter reproach to the "Christianity" and "civilization" which the average Briton is prone to somewhat arrogantly vaunt. In these later years of the Victorian age the soul of society, in the better moods of its less selfish and indifferent representatives, has been moved by the sufferings endured by children at the hands of drunken and violent parents and other natural or legal "guardians" of the young. The people of the United States, to our discredit, set us the example of founding "Societies for the Prevention of Cruelty to Children". The very name, betraying the proved need of such organized efforts for the defence of such victims, is an infamy for the countries where the oppressors exist. In 1883, Liverpool first took the work in hand, following in the steps of some good people at New York, and in the following year the London society was founded. There are now many local agencies either connected with the metropolitan centre, or using independent action, and convictions for cruelty have been, in a yearly increasing

measure, obtained against the perpetrators, but the operation of the law in this respect is still very deficient, and further legislation, and special authorities to set the law in action, are greatly needed. A Nonconformist minister, Mr. Benjamin Waugh, is a very energetic and able champion of children in London in this respect. The Criminal Law Amendment Act of 1886 deals severely with the crime of abduction for evil purposes, in the case of girls under eighteen years of age, and previous statutes assign the same penalty, two years' imprisonment with hard labour, to the abduction, for any purpose, of a girl under sixteen. Child-stealing is liable to fourteen years' penal servitude.

In two of our most recently-issued Encyclopædias the searcher after knowledge will find due notice of "reed" in its botanical and its musical senses, and of "Reed", the able naval architect, but he will vainly look for the name of Dr. Andrew Reed. Such is human justice to the memory of one of the greatest British philanthropists of the nineteenth century. This man, born in London in 1787, close to Temple Bar, by descent from yeomen folk in Dorsetshire, was the eminent, the unrivalled, benefactor of orphans, incurables, and idiots. In 1811, after acquiring learning in Hebrew, Greek, and mathematics, by the exercise of energy and self-denial after quitting his work as apprentice to a watchmaker, Reed became the pastor of an Independent chapel at the East End of the metropolis. In that capacity he laboured for nearly half a century, and died, surrounded by every sign of love and veneration from friends and strangers, in 1862. From an early age, this true lover of his fellow-creatures had felt specially drawn towards children bereft of one or of both parents. His mother was an orphan, and he had often seen female orphans, in his apprentice-days, when he went to an asylum to attend to the due working of the clocks. He began by adopting an orphan family, and placing them under a widow's care. He was obliged, however, to seek the pecuniary help of his flock, and his appeal resulted, after many efforts, in the foundation, in 1815, of the London Orphan Asylum. The benevolent author had wisely secured the aid of a clergyman of the Established Church as his associate in the honorary secretaryship, and the Dukes of Kent and Sussex, the Bank of England, the Dock Companies, the East India Company, the City of London, and the king, George the Fourth, became liberal patrons of his enterprise.

In 1825, at a cost of £25,000, the asylum, for orphans of both sexes, was opened at Clapton, to the north of London. This noble institution, when the oncoming tide of bricks and mortar threatened its healthful isolation in the fields, was removed, in 1871, to Watford, in Hertfordshire. Reed had already bethought him of an infant orphanage, for children under seven years of age, and in 1827 we find him again obtaining the help of royal personages. It is interesting, indeed, in this sixtieth year of a most glorious, beneficent, and prosperous reign, to read a letter dated March 20th, 1828, in which the helper of the young bereaved writes "The Duchess of Kent has been pleased to say that we shall have her help, and that of her little orphan daughter Victoria, to a cause which, had he lived, her father would have espoused". Thus finally came, after earlier forms, the Infant Orphan Asylum at Wanstead, in Essex, with its 600 inmates, and receipts amounting to nearly half a million pounds. The building was completed in 1842, at a cost of £40,000, and this estate passed into the hands of the Anglican Church, sixteen years after Reed had founded the modest beginning at Hackney Road, in London. The wisdom, as well as tenderness, that belonged to the man are displayed in the instructions given to and concerning nurses and teachers at his asylums. "Remember that the eye needs agreeable objects on which to gaze, the ear needs sweet harmony, and the heart seeks human sympathy, as surely as the stomach requires suitable food." "Children love birds and flowers. Birds, flowers, and children love air and light. Those who love children love also birds and flowers; and such are fitted by Providence to become their best nurses. Let them be sought out, and let none others be employed in this important duty." In 1844, he founded the Asylum for Fatherless Children, regardless of sect, party, or religious tests, with its final home in Surrey, called Reedham, near Croydon. Reed next turned his attention to the most helpless of human beings, the mentally imbecile known as idiots. The British Isles now contain more than twelve excellent institutions of the class founded by him in 1848, in a mansion on Highgate Hill, in the north of London, the origin of the famous Earlswood Asylum for Idiots, near Redhill, in Surrey, opened in 1855, which has received pecuniary support to an amount of over a quarter of a million sterling. The unwearied philanthropist, in 1845, started the

Royal Hospital for Incurables, which became a large establishment, in 1854, at Putney Heath, near London.

The effect wrought by men like Andrew Reed is but slightly shown forth in the existence of the institutions which are the direct outcome of their benevolence of soul and their energetic will and effort. Most of the orphan asylums connected with London have been founded since the year 1850. At that date there were seventeen, and now their number exceeds sixty. Some mention has been made of the founding of hospitals for the sick during the eighteenth century. The number of these charities has so vastly increased, beyond all proportion to the growth of population, as to preclude any attempt to deal with them by name. In London alone, besides the great institutions connected with famous medical schools, there are scores of hospitals, infirmaries, and dispensaries for general and for special disease in men, women, and children, variously supported by all classes of the community save the poorest; by endowments, legacies, annual subscriptions, donations, and by the ratepayers, under the action of the Poor Law, which has provided, since 1870, parish infirmaries for the sick and helpless. The excellent movement called "Hospital Sunday", due to the suggestion of Dr. Wakley, then editor of the *Lancet*, in 1873, sets apart one Sunday in the year for collections throughout the land at the religious services of almost every church and sect, the funds thus gathered being divided among the hospitals of all kinds. Nearly three-quarters of a million sterling is the amount thus gathered for the relief of bodily sufferers. A "Hospital Saturday", for collections in factories, workshops, and like places, has also been introduced with much success. Edinburgh, Dublin, Glasgow, and other large towns have also benevolent institutions in great number for the sick, and cottage-hospitals, with from three to ten or more beds, are recent welcome additions to the county hospitals and the town infirmaries of each large district. Of one thing there can be no doubt whatever. Among all the countries of the world, Great Britain stands foremost for the number, variety, and far-reaching influence of her charitable institutions. We take London as an example for illustration, without any disparagement of her sister capitals in the United Kingdom, or of other great towns, being implied in our selection of that epitome of the whole nation. Apart from the funds for charitable uses dispensed by the City

Companies, and from all parochial efforts of the Established Church and other religious denominations, there are more than a thousand charitable institutions in the British metropolis. Besides about 140 dispensaries and hospitals, and more than eighty alms-houses, we find associations and abodes for the benefit of retired soldiers and non-commissioned officers, orphans of all classes, the deaf and dumb, the workers in shops sorely needing earlier hours of closing, reduced governesses, "little boys", "working boys and working girls in London", the indigent blind, the widows of medical men, seamen of the navy and merchant service, "homeless and destitute children", the sick and wounded in war, newspaper writers, news-vendors, widows of soldiers, sailors, and marines, young girls who have fallen or are in danger of falling, railway men, "old and disabled soldiers", children of freemasons, worn-out nurses, sea fishermen, shipwrecked fishermen and mariners, "soldiers' and sailors' families". Noting that there are in London alone about thirty institutions on behalf of the blind, we observe that of late years very much has been done in this direction. Since 1851, owing to various causes, there has been a constantly-accelerating decrease in the number of blind persons in Great Britain, and combined benevolence and ingenuity have devised excellent methods for alleviating the trouble of the incurably blind. Schools for indigent sightless persons began to exist in the last decade of the eighteenth century, and this previously helpless class have now been taught, in very many instances, to work at various trades, to play on various musical instruments, to amuse themselves in many outdoor sports, to read in books of special form, and, in general, to become far happier in being more active and useful. The number of deaf-and-dumb people in the British Isles also shows a considerable proportional decrease, and great progress has been made in teaching these unfortunate persons the means of communication through signs without sound. The first British school for this purpose was started at Edinburgh, in 1760, by Thomas Braidwood, an ingenious man, who in 1783 removed his establishment to Hackney, near London. The London Asylum, founded in 1792, had as its first head Dr. Watson, a nephew and assistant of Braidwood. At the present day, there are nearly fifty such institutions in the British Isles, and much further success has been gained in enabling learners to understand both manual

signs and lip-reading, or motions made with the lips and watched by the deaf person. The dumb have even been taught to speak, with various degrees of imperfection, by watching the mouth-movements of the teacher.

The Salvation Army has of late largely increased its work on the philanthropic side by practical efforts in behalf of the vast number of unemployed and homeless persons in the community. "General" Booth, in his remarkable work *In Darkest England and the Way Out*, expounded a wide and far-reaching scheme of triple ascending scale by which the outcasts were to pass first into an "urban colony", with shelter, food, and some kind of work; thence into a "farm-colony", as a preparation, in learning land tillage, for removal to transmarine colonies of emigrants to distant parts of the empire. In 1892 there had been already established shelters for men and women, prisoners' homes, rescue-homes, food-depôts, factories, bakeries, "hotels", "slum-homes", crèches or public nurseries for children whose mothers are out at work during the day, a farm of 1400 acres, laundries and other places for women's work, and departments for emigration, banking, &c. In the space of one year, about three millions of cheap meals were provided, and the institutions of this vast new system have been introduced into great provincial towns, and into Australia, Canada, and New Zealand. At a "salvage-depôt" on the Thames-side at Battersea, in London, rags, bones, bottles, tins, and other refuse, are collected, sifted, and utilized. Real help, through these numerous agencies, is provided for all but the impostors and "loafers" who, raising in processions the banner and the cry of the "unemployed", are aiming at nothing but misplaced sympathy in the form of beer.

Among our many illustrations of increased regard for human bodies and souls, we must not fail to note the change of public feeling on the subject of corporal punishment. For very many years of the nineteenth century, the main instruments of discipline in army, navy, the family, the school, were "Father Stick and his children, Cat-o'-Nine-Tails, Rope's End, Strap, Birch-Rod, Ferule, and Cane". In the schools of every class, the clever but mischievous, the merely stupid, the idle, the willing but dull spirits, were all, in their turns, severely and systematically flogged. Learning was forced in mainly by the rod and cane. The atrocities perpetrated

in the army and navy by means of the "cat", under cruel officers, or "martinets", would appear incredible, in their revolting details, to all who have not made their acquaintance by reading. Fine crews were, in more instances than one, driven to mutiny by brutal punishments for trifling offences, now met by fine or slight imprisonment or extra-duty. British soldiers, in the youthful days of a middle-aged man's father, were liable to, and were sentenced to, and suffered, a thousand lashes with the cat. There were instances of men dying under this barbarous infliction, which the officers of that day, up to the very highest, declared to be "needful for the maintenance of discipline". Humane members of the House of Commons, amongst whom the excellent Scottish Radical, Joseph Hume, was conspicuous, frequently made unsuccessful motions for the abolition of this cruel and degrading form of punishment in the services. In 1847, public feeling was strongly aroused by the death, in consequence of flogging with two hundred lashes, of a soldier at Hounslow Barracks, near London. The matter was taken up by Mr. Wakley, of the *Lancet*, Radical member for Finsbury, one of the London parliamentary boroughs, but he and his supporters again failed to procure a vote of the Commons for the abolition of flogging. The Duke of Wellington, however, as Commander-in-Chief, now issued an order restricting the number of lashes to fifty. About 1856, sentences of corporal punishment began to be generally remitted, except in the case of troops on active service. In 1868, Sir Arthur Otway, Liberal M.P. for Rochester, after many efforts in the same direction, carried an amendment which abolished flogging in time of peace. The mere legal existence of this form of punishment had long prevented a good class of men from entering the army and navy as private soldiers or ordinary seamen. In 1879, another step forward did away with flogging in time of war, except for offences punishable with death, such as treachery, cowardice, mutiny, violent insubordination, and sleeping, as sentry, on a post of duty. At the same time, the number of lashes was limited to twenty-five. The Army Act of 1881 abolished the punishment altogether, though soldiers, like civilians, remained liable to the infliction of twenty-five lashes as prisoners in common jails, for breaches of prison rules, and for highway robbery with violence, under a statute passed for England and Wales in 1863. Juvenile offenders can still be, and are some-

times, moderately whipped with a birch-rod, under local Police Acts, and at the discretion of Justices. It is needless to dwell upon the great change which public opinion, rather than the action of law, has brought about in school-punishments. The birch-rod is still sparingly used at Eton and some other great public schools, and a very slight use of the cane still exists in schools of every class, but the instrument is no longer employed as a means of instilling learning into youthful minds.

In no point of the treatment accorded to persons under needful restraint has a more thorough change been effected than in the system of dealing with those who are afflicted with mental derangement. Here again, the cruelties which were committed in the earlier decades of the nineteenth century almost overpower the capacity of belief in the present age. It is a horrible fact that the blind insane old George the Third was sometimes struck by his brutal keepers at Windsor Castle, when he was under the nominal charge, first of his wife, and then of his second son, the Duke of York. We may surmise what was the fate of the king's demented subjects. They were regarded simply as nuisances, and they were treated worse than the criminals in the prisons. The elaborate absurdity of the means employed for coercion and cure was based, it seems, upon the superstition of insanity being caused by the indwelling of an evil spirit, to be driven out by the influence of force and terror. Flogging in certain doses, involuntary plunging into cold baths almost to drowning, whirling round in rotating chairs, chains, semi-starvation, strait-jackets pinning the arms to the body, were medical prescriptions for the treatment of lunatics. The earliest reformers were Philippe Pinel, a benevolent French physician, at the time of the great Revolution in his country, and William Tuke, a Quaker of York. Science and philanthropy began their work in this behalf, and in 1815 a Parliamentary inquiry, revealing the evils that existed in asylums, led the way to gradual improvement. In 1831, in the new Metropolitan Asylum at Hanwell, in Middlesex, the superintendents, Dr. and Mrs. Ellis, adopted a method of treatment which found employment for the insane, with all due liberty. The labours of the male patients tilled the garden, built a great wall, dug a canal, and executed repairs. Most of the sufferers, of both sexes, attended chapel, and were quiet and orderly. The women, in their work-rooms, earned enough to pur-

chase an organ for the service. The patients were supplied with medicine that, through the body, worked with beneficial influence on the mind, and the recoveries from insanity far surpassed all previous experience. Dr. John Conolly, resident physician at Hanwell from 1839 till 1844, laid aside all forms of mechanical restraint, and by his noble enthusiasm, and his persuasive power in speech and print, was a most efficient reformer of the whole system of treatment for the insane. In Scotland, early in the nineteenth century, there were already, in all the larger towns, "royal chartered asylums" both for rich and poor, with fair treatment for the patients, and in the same country, about 1857, greatly improved methods were adopted in extension of freedom, out-door exercise, labour on farms, and cottage-life in the country. The state of things now existing in about 140 public and 120 private asylums for the insane throughout the British Isles represents, on the whole, a triumph of humanity and scientific knowledge. The laws relating to demented persons have been greatly altered during the century, largely owing to the exertions of Lord Shaftesbury, who was for more than half a century chairman of the Lunacy Commission. The English Lunacy Act of 1845 caused the erection of asylums in every county, and instituted a Board of Commissioners for inspection of and report upon the treatment of every patient. In Ireland, the system is equally efficient and humane with those of her sister-countries.

The "Knights of St. John", instituted about 1830, and having their headquarters at Clerkenwell, in London, profess themselves to be revivals and representatives of the old military religious order of that name, otherwise known as "Knights Hospitallers", "Knights of Rhodes", and "Knights of Malta", dissolved in this country by Henry the Eighth. Their work is now entirely philanthropic, being devoted to poor persons who have left hospitals as convalescents, and need further help in nourishing food or sea-air for restoration to perfect health; to the cause of cottage-hospitals, and to sufferers by accidents in the streets. For these last, the ambulance-system was founded in 1877, providing "first aid", and instruction in the methods of rendering such assistance, given to all persons who attend the lectures of the society. The policemen, in most cases, are thus trained, and local centres, in many large towns, hold ambulance-wagons and attendants ready

for summons by telephone or messenger. In Scotland, the St. Andrew's Association, based on the English model, does the same beneficent work. On the battlefield and in war-hospitals the Knights of St. John have won their greatest fame, as largely concerned in founding the Red Cross Societies whose badge and flag, borne by men and women of various nations, are known throughout Europe, with the full recognition of military authorities, and with certain privileges and immunities secured by the international Geneva Convention of 1864. The St. John's and other societies, in this country and abroad, prepare supplies of stores, and train nurses, for the aid of the sick and wounded in every country where war may arise, with the security of neutrality for all concerned in rendering that service, the persons and wagons, and depôts and tents, being all marked, for that purpose, with the red cross on a white ground, plainly visible to all belligerents. The "Royal Red Cross", instituted by Queen Victoria in 1883, is a decoration composed of crimson enamel with gold edges, on a dark blue ribbon with red edges, worn on the left shoulder by ladies, British or foreign, recommended for special merit by the Secretary of State for War.

The abolition of war itself, as a means of settling international disputes and quarrels, is the object aimed at by the Peace Society, founded in London in 1816, mainly by members of the Quaker body, or Society of Friends, on an international and unsectarian basis. The Peace Society has, unhappily, not yet succeeded in abolishing war, but its influence has been nobly displayed in the creation of scores of like associations in the United States and in some Continental countries, and of other great British societies devoted to the same cause. For armed conflict between nations these lovers of peace would substitute arbitration. Since the conclusion of the great war in 1815, there have been sixty instances of the successful adoption of this principle of settlement of questions between nations, of which we have seen signal examples in our own dealings with the United States of America. The last case of this kind occurred in the Behring Sea Arbitration of 1893 in Paris, when a peaceful settlement was again obtained between Great Britain and the States on questions concerning the seal-fishery in the waters on the adjacent coasts of north-eastern Asia and north-western America. The eloquent words of the British counsel before that

tribunal, then Sir Charles Russell, Attorney-General in Mr. Gladstone's fourth and last Ministry, will find an echo in the hearts of all lovers of their fellow-men. "The submission to arbitration is a great fact—a fact of weighty moral significance. There are two Great Powers before this tribunal, one a representative of the civilization of the Old World, great in its extent of dominion, greater still in its long-enduring traditions of well-ordered liberty, and in the stability of its institutions; the other a young but stalwart member of the family of nations, great also in its extent of territory, in the almost boundless resources at its command; great too in the genius and enterprise of its people, and possessing enormous potentialities for good in the future of the human race. These powers are in difference. Great Britain conceives that she has been wronged by these seizures (of vessels), that her sovereignty has been invaded, her rights upon the high seas set at naught. Happily, the dread calamity of war was avoided. These nations have not sought to turn their plough-shares into swords to settle their differences. They are here before you, friendly litigants, peaceful suitors in your Court, asking by pacific means the adjustment and determination of their rights in times of peace. This is indeed a fact of great moral significance. 'Peace hath her victories not less renowned than war.' This arbitration is—who will or can gainsay it?—a victory for peace. Will your award be a victory for peace? You, gentlemen of this tribunal, alone can answer. It will be, it must be, a victory for peace, if, as I cannot permit myself to doubt, it conform to and leave untouched and undoubted the principles of the (international) law which have been consecrated by long usage, stamped with the approval of generations of men; that law which has grown up in response to that cry of humanity heard through all time, a cry sometimes inarticulate, sometimes drowned by the discordant voices of passion, pride, ambition, but still a cry, a prayerful cry, that has gone up through all the ages for peace on earth and goodwill amongst men." It only remains to add that the award of the tribunal fully answered to the expectations of the British advocate and of the British nation that appointed him to represent her interests and rights. The decision given saved the honour, and satisfied the wishes, of all reasonable men in the two great kindred nations who had again set the world a noble example of self-restraint and sound judgment in seeking wiser and better

modes of settling disputes than resort to the always violent and cruel, and often unjust, arbitrament of battle.

Among those who have sought the advantage of the poor in the Victorian age we must not forget that excellent lady, Miss Octavia Hill. Born about the beginning of the reign, she was a granddaughter of the eminent sanitary reformer, Dr. Southwood Smith. After working amongst the London poor under the auspices of the Reverend F. D. Maurice, whom we have already met in these pages, she began, in 1864, with the strong support of Mr. Ruskin, to improve the homes of the toilers who dwell in the courts and alleys of the metropolis. Teaching the people to help themselves, she did much to instil a new regard for order, cleanliness, and self-respect, and very many homes were thus brightened, and the dwellers therein made richer in comfort, and in happiness based upon moral reform. It was she and her sister who, in 1875, founded the admirable Kyrle Society. This happily-named association derives its title from John Kyrle, a philanthropist of later Stuart days, immortalized by Pope, in his *Moral Essays*, by the splendid eulogy on the "Man of Ross", who, at his own charges, and by the aid of others whom his zeal stirred to action, "hung with woods" the "mountain's sultry brow"; "Whose causeway parts the vale with shady rows, Whose seats the weary traveller repose". The allusion is to the planting and other improvement of some hilly ground and adjoining valley at his native town in Herefordshire, overlooking the beautiful river Wye. The beneficent aim of the modern Kyrles is to impart the pleasure derived from artistic and natural beauty to the handworkers of our time by the decoration of their homes, of hospital wards, and of their clubs; by fostering the creation and maintenance of "window-gardens", obtaining and laying out open spaces, such as disused churchyards and waste-grounds, in country and town, as gardens for the people, and by furnishing music at concerts in public halls and in the open air.

Mr. Samuel Plimsoll, the devoted friend of British merchant-seamen, has already been seen in conflict with a ministry on their behalf. He found by inquiry in numerous cases that sailors' lives were being constantly hazarded, and often sacrificed, through the greed of villainous ship-owners who sent their vessels to sea overladen, with dangerous deck-cargoes, ill-found and under-manned,

but amply, and more than amply, insured against the owner's pecuniary loss. He had good reason to believe that some of these "coffin-ships" were deliberately sent forth in order to be lost, with a good profit to the loser, through callous wickedness that amounted to deliberate, systematic, and wholesale murder. He entered the House of Commons, as a member for Derby, in 1868, and published his startling work, *Our Seamen*, five years later. The Merchant Shipping Act of 1876, carried by his influential indiscretion and zeal, gave him an honourable place among public benefactors. The "Plimsoll Mark", which all may see on the sides of ships in harbour, is the visible sign of that legislation, indicating, by a circular disc of white paint amidships, with a horizontal line drawn through its centre, the load-line down to which, in salt water, the vessel may sink, and not beyond, for safety on her voyage. The same statute gives power to the officials of the Board of Trade to detain unseaworthy vessels in port for examination, and inflicts heavy penalties on ship-owners allowing cargoes to be stowed without regard to certain rules for safety. Since 1890, the load-line, with the Plimsoll mark, has been fixed by the agents of the Board of Trade, instead of at the judgment of the ship-owner.

We deal now, in this long record of British beneficence, with some more great examples of local and general munificence and philanthropic effort. An early example in this line is that of Mr. James Dick, a native of Forres, who became a merchant in London engaged in the West Indian trade, and at his death in 1828 left a sum exceeding £113,000 for the promotion of higher learning amongst the parish schoolmasters of the shires of Elgin, Banff, and Aberdeen. Schoolmasters proved proficient by examination thereby received awards of money and annual stipends during tenure of office. Sixty years later, this noble bequest was furnishing a yearly interest exceeding £4000, and the teachers were receiving an average annual payment of £31. The Dick Bequest has thus been of great benefit in the cause of Scottish education. Mr. James Baird, a native of Lanarkshire, son of a colliery-owner, acquired enormous wealth as an ironmaster, and after building and endowing various schools, and founding, in 1871, the "Baird Lectures" for the defence of orthodox theology in Scotland, he bestowed on the Established Presbyterian Church, in 1873, the sum of half-

a-million sterling, to be employed for the relief of "spiritual destitution among the people of Scotland". Sir William Brown, a native of county Antrim, became a Liverpool merchant of immense wealth, and an active social reformer, specially zealous in the cause of education. In 1857, at a cost of £40,000, he founded the noble Free Public Library of Liverpool. Prominent in all good works, he showed his patriotism by raising, in 1859, at his own charges, a corps of volunteer artillery. The Baroness Burdett-Coutts, raised to the peerage in 1871, stands among the highest in the list of public benefactors. Inheriting the wealth of her grandfather, Thomas Coutts, the banker, she has made a noble use of it in building and endowing churches and schools, establishing colonial bishoprics, founding reformatories and refuges, and erecting Columbia Market and Square, at the East End of London, for the benefit of the poor; in countless acts of private aid to the deserving, in assisting emigration, and in general efforts to promote the well-being of her own sex, and of the lower animals. In the first half of the century, Sir Thomas Fowell Buxton, whose statue may be seen in Westminster Abbey, was prominent among the philanthropists aiming at the reform of prison-discipline and of the criminal law, and at the abolition of slavery, in which last cause he succeeded, in 1824, to the place so long held by William Wilberforce, whose health, after arduous labours, had begun to fail. In the present day, Mr. Henry Tate, of Park Hill, Streatham, near London, is distinguished by his princely liberality in fostering the taste for literature and art. The Tate Libraries at Streatham and Brixton, and at least one more of the same foundation in Lambeth, are greatly beneficial to the populations among which they stand, but even these, in point of munificent expenditure, are eclipsed by Mr. Tate's bestowal on London of his fine collection of pictures, with the sum of £80,000 for the erection of a fitting gallery, now being constructed at Millbank, Westminster, near the Houses of Parliament. Mr. Passmore Edwards, proprietor of the *Echo* newspaper, has of late years been prominent for munificence in founding or aiding various beneficent institutions.

No record of philanthropy could do justice to Queen Victoria's subjects which failed to mention that most remarkable and famous Jew, Sir Moses Montefiore, born at Leghorn in 1784. In 1885 he died at Ramsgate, aged nearly 101. No century of life wi

ever more nobly passed than by this "Israelite indeed", the most devoted friend of freedom that his countrymen ever found to fight their battles. His sympathies were not confined to his own race. Ever prominent in the struggle for removing Jewish civil disabilities in Great Britain, he was also one of the parties to the contract for the slave-holders' compensation, according to the Act of 1833. Between 1827 and 1874, he made seven journeys into eastern and south-eastern Europe, and into Syria, seeking to deliver his fellow-Jews from oppression, and on one occasion, at least, risking his life as he faced, on their behalf, the fury of a fanatical "Christian" populace.

The ranks of manufacturers and merchants are rich in examples of public beneficence. At Halifax, in the West Riding of Yorkshire, the name of Sir Francis Crossley will ever be held in the highest esteem. Part of the wealth derived from his vast fabrication of carpets was employed in providing for the town, in 1857, a fine public park, at a cost of £40,000; other large sums were expended in almshouses and orphanages, and in aiding the work of the London Missionary Society, and the Congregationalist or Independent community of which Sir Francis was a member. Sir Titus Salt, whose distinction as a manufacturer we have already seen, was another fine illustration of north-country energy, liberality, and practical wisdom. His works at the happily-named Saltaire, on the river Aire, near Bradford, opened in 1853, were the centre of an industrial town, erected entirely at his cost, and provided by him with all the appliances of the most enlightened form of modern civilization. A contrast, indeed, were the workman's life and treatment at Saltaire with the bygone infamies of the earlier "factory-system". A Congregational church, a fine Sunday-school, day-schools for 750 pupils, baths and laundries, a hospital and an infirmary; almshouses for widows and aged workpeople, with a lawn and shrubbery; a beautiful park of 14 acres on the banks of the river; a club and institute, with a large library, evening-classes, lectures on literature and science, chess-room, and billiard-room, were the provision made by this great benefactor for the religious, intellectual, moral, and physical good of those who were increasing his wealth by their toil. Sir Titus Salt's donations to public causes, in addition to all the above expenditure, amounted to many hundreds of thousands of pounds.

Mr. Mark Firth, a native of Sheffield, whose life extended from 1819 to 1880, was a proprietor there of the great steel-works chiefly noted for the making of cannon. His benefactions to the town included almshouses, a public park, and the endowment of Firth College, opened in 1879, with a principal and eleven other lecturers or professors. The same great town has been enriched with a handsome art-gallery, costing £15,000, and a large collection of pictures, by the Mappin family, manufacturers of various useful and ornamental goods in metal.

Mr. John Sheepshanks, born at Leeds in 1787, became a wealthy cloth-manufacturer, devoted in his leisure-hours, and after retirement from his business, to the purchase of modern British pictures. His gallery, consisting of nearly 250 oil-paintings, and about 100 drawings and sketches, was of enormous value, being specially rich in the works of Leslie, Landseer, and Mulready. In 1856, he presented the whole of these works to the nation, and they now fill three large rooms at South Kensington. Mr. John Macgregor, born at Gravesend in January, 1825, was one of the infants saved at the burning of the *Kent* East Indiaman, described above among the marine disasters of the century. After graduating, as a wrangler, or first-class man in mathematical honours, at Cambridge, he became a notable traveller in Egypt, Palestine, Canada, and the United States, and specially famous for his canoe-voyages in the *Rob Roy*, a little craft named after his celebrated ancestor, the Highland chieftain of Scott's romance. An account of one trip, extending over a thousand miles, was published by Macgregor in 1866. He did much useful work on the London School Board, and as chairman of the Industrial School Commission, and bestowed on various benevolent schemes and institutions the profits derived from his books and his public lectures, exceeding the sum of £100,000. Sir Josiah Mason, a native of Kidderminster, beginning life as a street cake-seller, became, at Birmingham, the largest maker of steel-pens in the world. Ever liberal, as a business-man, in paying inventors for the products of their brain-power, he became deservedly rich. More than a quarter of a million of his money was expended on the erection and endowment of almshouses and an orphanage, and another great sum on founding the Josiah Mason College, at Birmingham, opened in 1880, for the special purpose of a practical, mechanical, scientific, and artistic education adapted to

the needs of the manufactures and industrial pursuits of the Midlands, with the exclusion of all mere literary, and of all theological instruction. This great institution is connected with the University of London for degrees, honours, exhibitions, and scholarships in arts, science, and medicine. Mr. George Müller, born in Prussia in 1805, came to England in 1829, and began an evangelistic and philanthropic career of very remarkable character. As minister of a chapel at Teignmouth, in Devonshire, he had no collections made at the doors or pews for charitable objects, but left all such support to contributions sent in reply to the prayers which he offered. In 1836 he founded, at Ashleydown, Bristol, an Orphan House maintained solely on the above principle. In the course of 20 years, over £84,000 had been received, and nearly 300 orphans were being maintained and taught. In 1875, Mr. Müller's Orphan Homes had more than 2000 children, and in 1889 these and some kindred institutions were annually costing £36,000, a sum derived from voluntary offerings solely due to benevolence actuated by the "prayer of faith".

Our list of benevolent Britons in the nineteenth century closes with Mr. Samuel Morley, born in 1809, who became, in 1854, head of the great hosiery-business in Wood Street, City of London, employing about 3000 persons in seven factories and at the warehouse. Before his death in 1886, Mr. Morley declined a peerage, offered to him mainly on the ground of the high public esteem won during a life of devotion to religious and philanthropic causes, in which he was a middle-class commercial rival of Lord Shaftesbury. Many thousands of pounds were given towards the erection of Congregational chapels and schools, and the public subscription-lists for objects of great and pressing need always contained, for many years, the item—"Samuel Morley, Esq., £1000". This great and systematic munificence only represented, however, a part of the noble beneficence of this true merchant-prince. He knew that there were countless deserving persons, in the middle and lower-middle classes, reduced to distress through various ill-fortune, too proud to seek public relief, but willing to receive aid from the private hand of such men as himself. These he sought out through the agency of friends, and, in the event of applications made for assistance, he employed his own paid confidential clerks to investigate each case with all due delicacy, combined with thorough-

ness of treatment, as a guard against impostures. There were thousands of instances, unknown to the world at large, in which his purse was opened, with the utmost advantage, for the help of those who wished to help themselves. Fatherless lads were educated and brought into trades or professions; widows and their daughters were provided with work; timely gifts to disabled bread-winners in mercantile and professional ranks provided the medical relief, the needful nourishment, the restorative air of a country-home or a sea-side lodging, which sent them back with new strength to the battle of life. Eulogy would but weaken the impression made by the bare recital of a benevolence so intelligent and so wide, so effective, so quiet, so nearly conformed to ideal goodness and wisdom.

We must not fail to notice, before closing this section, the admirable work, now in its hundred and twenty-third year, of the Royal Humane Society, founded in 1774 for the resuscitation of persons rescued from water in a drowning and often seemingly dead condition. Thousands of lives have been saved by applying various methods of causing artificial respiration, one of which was invented in 1856 by Dr. Marshall Hall. The boats, boatmen, and apparatus of the Society are familiar to skaters in the London Parks, many of whom have been rescued from amidst broken ice, and kept in life after immersion, when the lack of prompt remedies would have left them to perish from the effects of the shock caused by intense cold. The chief work of the Society lies in its generous endeavours to reward, and therefore to stimulate, the heroism that bravely risks life in order to save the lives of others. In the year 1893, one gold medal, eleven of silver, and 190 of bronze, with many clasps, testimonials on vellum and parchment, and certificates accompanied by pecuniary rewards, were distributed to persons who had, in many cases with sublime self-devotion and courage, delivered others from the peril of drowning. It is cheering to observe that the noble list includes not only young ladies, a lad of nineteen, several schoolboys and a schoolgirl, who all, in separate cases, rescued men from drowning, but a chimney-sweep, a potman, and two or three footmen. Thus do British courage, coolness, resource, and self-possession give assurance to the world that the race is not degenerate. It is not needful to succeed in brave attempts in order to earn recognition from the Humane Society,

and the relatives of those who perish in such endeavours receive "in memoriam" testimonials to be cherished with lasting pride and with consolation in the hour of mourning.

The Queen, in memory of her beloved husband, instituted the Albert Medal, in 1866, as a reward for the heroic acts of mariners and others in saving life at sea and on our storm-beaten coasts. In the following year, two decorations, of the First and Second Class, were appointed, and in 1877 the Albert Medal was extended to acts of courage in saving life on railways, in mines, at fires, and in other cases of danger on land. The order has been frequently awarded in both classes, and is highly valued by recipients from its being strictly and impartially confined to persons of conspicuous and well-proved merit.

CHAPTER XIII.

TEMPERANCE.

Hard-drinking of former times—Improved habits of society—Origin of temperance and total abstinence societies—The National Temperance and Scottish Temperance Leagues—Church of England Temperance Society—Mr. Gough and Father Mathew—Bands of Hope—Rechabites and Good Templars—The United Kingdom Alliance—Sir Wilfrid Lawson—Legislative restrictions on the drink traffic.

Whatever doubt may exist as to improvement in other departments of morality, there can be no doubt that the people of the British Isles are a vastly more sober nation, as regards indulgence in intoxicating liquors, than in the later years of the reign of George the Third. The general, and true, impression left upon the mind by the literature of the time, by the records called "Memoirs", and by the tales of our grandfathers, is that drunkenness, in the years preceding and long after Waterloo, was a vice very prevalent in all classes of society. As Prince-Regent and as King, George the Fourth was a heavy drinker; most of his royal brothers, and of the noblemen and gentlemen around him, and many throughout the land, kept him in countenance. A clergyman would not then greatly suffer, in the esteem of many of his flock, in country or town, for occasional lapses in that direction. Students at the Universities were much given to drink; the "Dons", their "pastors and masters", their lecturers and tutors, in the common-room or

combination-room after "Hall", or dinner, drank much old port. The customs of society forced people to drink. Not an event in human life, from the cradle to the grave, from christening to the coffin, but was made an occasion for imbibing wine and spirits. The farmer grew uproarious over strong ale. The labourer and the artisan poisoned themselves with bad beer and worse gin. Officers of both services got drunk at the mess-table; the private soldier and the seaman bettered the example, at the risk of flogging for their flattery in imitation. The Irish gentry flustered themselves with oceans of claret; the Irish bar was notorious for drinking, as for duelling. What our neighbours beyond the Border were in the earlier decades of the nineteenth century, as regards strong drink, we learn from the Scottish judge, Lord Cockburn's, *Memorials* and *Journal*, and from Dr. Ramsay, Dean of Edinburgh's, *Reminiscences*. Scot does not libel Scot, we may be sure, and in sooth, our northern brethren in that age were a hard-drinking race. When Queen Victoria came to the throne, that then youthful sovereign began to rule over the most drunken nation in the world, a distinction long retained, and only recently and happily lost. The greatest of English humourists and writers of fiction, in the *Pickwick Papers*, published in the year of the Queen's accession, displays a middle and a lower class reeking with drink. That delightful creation of the author, Mr. Pickwick; his wonderful servant, Sam Weller; old Weller the coachman; Bob Sawyer the medical student,—all live a life of frequent indulgence in over-much liquor, and one of the most amusing scenes in the book is a description of a meeting in which the advocacy of temperance, in the form of total abstinence, is treated with merciless ridicule. The lover of his country can regard with no other feeling than thankful satisfaction the enormous change which has now come over the land. The phrase "as drunk as a lord" is meaningless. The "undergrads" of Oxford and Cambridge are, by hundreds, in habit not connected with the signing of any pledge, total abstainers. A drunkard, not only in the upper and the middle classes, but amongst decent artisans, is a social outcast. His presence is intolerable, and he is wrecked in his fellows' esteem. The medical students are now a sober race. The army and the navy contain thousands upon thousands of pledged total abstainers. The drinking of toasts and healths, at private dinners and other parties, is wholly gone, with the absurd utterance

of "sentiments", and the once rampant indulgence in practical jokes which would now be resented by violent assaults. At hundreds of dinner-tables in the West End of London, with guests including people of the highest distinction in rank and fashion, literature and art, and of every profession, not a glass of wine per head is consumed. The wine, and of the best, is there, but the taste for it has departed, and Bacchus is, let us hope, for ever dethroned in that section of society.

We proceed to a brief account of the men and the measures to be mainly credited with such improvement as has come, in this regard, to the nation still far too much addicted to spirituous liquors. Dealing first with voluntary efforts, we find the people of the United States first in the field against the use of intoxicating drinks. The earliest known temperance societies in the British Isles arose in Ireland, in 1817, but no general movement took place until 1829, when members of associations, either for abstinence from spirits, or for total abstinence, were enrolled in Wexford, Belfast, Dublin and other towns. Before the close of 1830, there were many societies in Scotland, and early in that year the first English society came into existence at Bradford, in Yorkshire. This example was followed in many great towns, and in 1831 a national association, "The British and Foreign Temperance Society", was formed in London. The first strong advocate of utter abstention was Mr. Joseph Livesey of Preston, who, in 1832, started the pledge to that effect, the expression "tee-total" being due to the humorous emphasis (not, as is commonly supposed, to the stuttering) of one of his converts, insisting on "tee-tee-total" abstinence from strong drink. The new principle was widely adopted, and in 1836 the first general society in England, on this basis, arose in the "British Association for the Promotion of Temperance". As the cause made its way in public opinion, the National Temperance Society was formed in London, in 1842, and in 1844 the Scottish Temperance League was founded at Falkirk. In 1856, the union of the National Temperance Society with the "London Temperance League" created the "National Temperance League", and at last religious bodies, as such, took up the temperance question. All the Churches of Scotland, and the chief Nonconformist bodies in England and Wales soon had their special associations, and the Church of England Temperance Society was

formed in 1873, on the double basis of total abstainers and moderate users of alcoholic liquors. Large numbers of the clergy are now strict teetotallers. The "League of the Cross" promotes the cause among British and Irish Roman Catholics. Among the more zealous and efficient advocates of temperance we may name Dr. Jabez Burns, a Baptist minister; and Mr. J. B. Gough, a native of Kent, born in 1817, who emigrated to New York, and was reduced to penury, with the loss of his wife and child, by drunkenness. In 1842, persuaded by a Quaker, he took the pledge, and, after one relapse, he became a firm adherent of the cause of total abstinence, and a very powerful and effective lecturer. In 1853-55, 1857-60, and 1878 he addressed crowded meetings in the British Isles, and made thousands of converts to the reform which had become the chief object of his life and labours. In Ireland, from 1838 to 1843, Father Mathew, a priest at Cork, had a marvellous success among his countrymen as an apostle of temperance, and the movement spread all over Ireland, and to the Irish "colonies" in Liverpool, Manchester, Glasgow, London, and other great British towns. He made, literally, millions of converts to total abstinence, but his swift and wonderful success was not, unhappily, so steadfast as it was striking. Many medical men became earnest supporters of the total disuse of alcohol both in health and disease, one of the most eminent being the late Sir Benjamin Richardson, F.R.S., a distinguished inventor of medical appliances and a great sanitary reformer. Among the young, the advance of sobriety has been greatly served by the well-named "Bands of Hope", enrolling youthful pledged abstainers, and now numbering, in the Union formed in 1855, more than 15,000 juvenile societies, with above two millions of members. There are many other associations, such as "Rechabites" and "Good Templars", connected with friendly societies and benefit clubs, and special women's societies, including in all many hundreds of thousands of members. The cause has also been served in the raising of the duties on spirits, the removal of the excise-tax upon malt, the lowering of fiscal charges upon the light French wines and, above all, by the reduction of the tea-duty from *2s. 2d.* in 1840 to *6d.* per lb. in 1865, as at present. The increased use of cocoa as a beverage has also had its effect, and the improvement in non-alcoholic liquors of the "ginger-beer" and "ginger-ale" class has been very beneficial,

along with the opening of hundreds of coffee-houses of a popular and attractive kind, during recent years, in London and the chief provincial towns. The drinking-fountains in public places of resort are among the many devices by which the friends of the people strive to tempt them from hurtful to harmless beverages.

The first organization that aimed at the total or partial suppression of the sale of alcoholic liquors, by legislative action, was the United Kingdom Alliance, formed in 1852. The movement then started has used all its agencies and efforts for the election to the House of Commons of members favouring the "direct veto" policy, which would enable local electors in every division to decide whether or not any sale of liquor at all, or how many houses for the sale thereof, should be permitted to exist. This policy acquired the name of "Local Option", and Bills in its favour repeatedly failed in the Commons between 1864 and 1880, in which last year, as in 1881 and 1883, resolutions for the veto or local option were carried by rising majorities of 26, 42, and 87. The general election which took place in the summer of 1895 appeared, in the result, to set aside for the time attempts at any legislation of the kind above indicated. By far the most prominent man in Parliamentary action and in general public advocacy of temperance, during the last quarter of a century, has been Sir Wilfrid Lawson, the Cumberland baronet of ancient lineage, whose "gay wisdom" of speech was lauded by his political opponent Disraeli. This sturdy upholder of social and moral reform should have been, according to all conventional notions, a sour, austere, grim, dismal personage, detesting all jokes and levity of speech or manner, full of fanaticism and unpleasant zeal. Nothing could be further from the truth than such a portraiture of this most genial, delightful, humorous, and yet thoroughly sincere, benevolent, and earnest striver after temperance for his fellow-men. As a man of the world, in the best sense of those words, Sir Wilfrid has rendered to the cause which lies so near to his heart far better service than could have come from any mere fanatic, however gifted with eloquence of speech. He has never wearied his listeners, nor made his subject dull or repulsive to the unconverted, even in that most critical and, for the man of one main subject, most hazardous assemblage, the House of Commons. Furnished by nature with a boundless supply of spontaneous, overflowing fun, he has con-

ferred on the cause of self-restraint the inestimable benefit of effectively retorting upon vicious excess the mockery directed against virtue, of turning the laugh even of drinkers of alcohol against those who assailed him and his cause with every kind of coarse, rude, and stupid epithet. Without the least bitterness or any abusive word, by genial humour alone, he has put to silence the satirists and jesters who once aimed scornful wit at teetotalism, temperance, and all their supporters, works, and ways. He first made the question endurable to the House, then interesting, and then delightful, and the movement which had long been a moral, a religious, and a popular force, became at last a Parliamentary force, a question with which politicians of both parties have to reckon in seeking the suffrages of any large constituency.

The legislative restrictions upon the sale of alcoholic liquors are known as the "Licensing Laws", and the whole subject is at present in a transitional state in England. The granting of licenses is in the hands of the borough and county magistrates. In England, the hours of sale, and other matters, are regulated by Acts of 1872 and 1874, which made midnight the latest hour for closing public-houses throughout the country, but with power to the magistrates, outside London, to appoint any other hour not earlier than ten. More effectual provision was also made for the good management of public-houses by the "endorsement" clauses, which give the magistrates power to endorse licenses with a statement of conviction for disorderly conduct allowed by the publican on his premises, or for the sale of drink to intoxicated persons, or for selling drink out of the legal hours, or for other conduct contrary to law and order. The endorsement might lead to the withdrawal of a license, and it thus became the interest of owners, as well as of publicans who are managers or leaseholders of the property, to see that good order is maintained. In Scotland, the Forbes-Mackenzie Act of 1853, carried by the then member for Peeblesshire, prohibited provision-merchants from selling excisable liquors "to be drunk on the premises"; permitted public-houses to be open only on week-days, between 8 a.m. and 11 p.m.; and forbade the sale of liquor in hotels throughout Sundays save to lodgers and to *bonâ-fide* travellers. In Ireland, save in the five largest towns, an Act of 1878 wholly closed public-houses on Sunday, and the same rule, in 1881, was applied to Wales.

CHAPTER XIV.

AMUSEMENTS AND ATHLETIC SPORTS.

Improvement in popular amusements—Holiday resorts—Public parks—The People's Palace in London—Coaching clubs—Polo and golf—Yachting—Athletic sports—Cricket and cycling—Lawn-tennis and archery—Gymnastics—Football—Wrestling and swimming—Running, walking, jumping, &c.—Aquatic sports—Mountain-climbing.

A vast improvement has assuredly come in the recreations of the great mass of society in the British Isles during the Victorian age. The enormous development of a taste for music, a topic elsewhere treated on its higher side, has been at once stimulated and satisfied by the greatly increased provision of military bands playing for public amusement, of temperance bands, workmen's bands, and other sources of stirring strains which, however frivolous they may be to the high æsthetic sense of "superior persons", can produce no possible moral harm to any listener. Concerts of good music, furnished at a cheap rate by professionals, or as a gratuitous boon coming from amateurs, are abundant in town and country, and penny-readings and book-societies in the larger villages, workmen's clubs in towns, music-halls, theatres where, for the most part, harmless drama is performed, are potent rivals of the once all-attractive public-house. The village-feast, with its coarse revelry, has almost vanished. The annual fair, and the showmen's vans, with their monstrous exhibitions, are things of the past which has buried out of sight the cock-fights, and dog-fights, and rat-killing matches of terriers, that were aforetime openly advertised and largely attended by men of every class. Experience has shown that the way to wean the people from vicious indulgences is to provide amusements which are either harmless or positively and vigorously beneficial.

The grand benefactor in this regard has been the steam-engine, locomotive and marine, which supplies the means of conveying the people, by tens of thousands, to scenes of natural beauty and artistic interest which their forefathers could never visit at all. Every great town in the British Isles has its own special favourite resorts, inland or by the sea, for holiday-makers, and we use illustrations, for London alone, which every reader can apply elsewhere,

when we refer to the healthful delights of trips to Epping Forest and Burnham Beeches, the Crystal Palace and Kew Gardens, Rosherville and Clacton, Southend and Richmond Hill, Hampton Court and Windsor. A notable feature of our later legislation has been the preserving of commons and open spaces near London and other great towns, for the enjoyment and good of the general public. These open spaces have been thus guarded from the encroaching hand of lords of the manor and the defiling, desolating grasp of the speculative builder seeking to make trees and grass give way to the hideous rows of his jerry-built "villas". The many commons near London are now under the control of the County Council, a body zealous not only to conserve, but to improve and adorn the ground thus committed to their charge. For Burnham Beeches, the noble relics of an ancient Buckinghamshire forest, about 25 miles north-west of London, the public are indebted to the munificence of the Corporation of London, who purchased, in 1879, nearly 400 acres of ground round the grand old trees, and gave up the area for general use in 1883. The same great municipal body were also the rescuers of the remains of Epping Forest, to the north-east of London, which, from a royal hunting-ground of 60,000 acres, had been reduced, by enclosures, to about 4000 acres in 1871. The Corporation also recovered nearly 1600 acres of recent enclosures, and at a total cost of about half a million, they dedicated the whole area, about nine square miles of woodland, in 1880, to the use of naturalists and urban lovers of sylvan scenery. The Bank Holidays, appointed by Sir John Lubbock's Act in 1871, have been very beneficial to the class of toilers who thus obtain a statutory right to relaxation from labour.

Among the modern provisions for combined amusement and instruction we may note, in London, the Zoological Gardens at Regent's Park, containing one of the finest collections of animals, birds, and reptiles in the world, opened in 1828, and vastly extended and improved in later years. In the capital, and in other great towns, there are also museums and galleries of great interest to persons of divers tastes, and the spread of education causes increasing numbers of the people to resort to these places for recreation rather than to seek amusement in what is debasing and destructive to health and to good morals. The People's Palace,

in Mile End Road, at the east of London, opened by the Queen in 1887, is a notable sign of the times in which we live. A gentleman named Beaumont, dying in 1840, left the sum of £12,500 to found an Institute, called by his name, for the moral and intellectual improvement of the working-classes in that quarter of the metropolis. About forty years later, Sir Walter Besant, the popular novelist, in his *All Sorts and Conditions of Men*, developed Mr. Beaumont's intention and idea in a manner which caught the public fancy, and the Beaumont fund was increased to £75,000 by contributions from wealthy individuals and, especially, from the Drapers' Company of the City of London. A fine room, called "The Queen's Hall", with seats for 2500 people, is provided with a great organ, and adorned with the statues of 22 female sovereigns placed at intervals along the walls. Concerts and other entertainments, a library and reading-rooms, gymnasiums, swimming-baths, social-meeting rooms, a winter-garden, play-rooms for children, technical and handicraft schools, picture-exhibitions, dancing, are included in the means furnished at this noble institution for the brightening of the lives, and the mental and moral benefit, of the poorer, hard-working citizens.

The vast development of cricket, cycling, and football in these later days of the century, and of boating and canoeing on rivers and artificial lakes, apart from rowing as an art and an athletic exercise, shows us forms of popular amusement obviously beneficial to body and mind, and hurtful only in rare excess of exertion, or by accident inseparable from human affairs. Modern improvements in the art of amusing include a great progress in pyrotechny, or the making of fireworks, most brilliant, beautiful, and artistic displays of which are familiar to the countless visitors at the Crystal Palace and other like scenes of outdoor recreation.

Nor must the modern amusements of the affluent be forgotten. The revival of coaching, as a summer-delight, came in the "sixties" of the century, when four-horse vehicles, well-equipped, with guard and horn complete, began to run to Brighton, under the auspices of various noblemen and gentlemen, who supplied the coaches and their teams, and conveyed passengers to and fro at moderate charges. This enterprise was followed by journeys, in the brighter and warmer months, to many beautiful spots round London, as Sevenoaks, Virginia Water, Dorking, and Reigate, and, at one

time, as far as Portsmouth. Changes of route and proprietorship often occurred, though the Brighton road has rarely been left vacant of these reproductions of the past, and still, throughout the year, displays in this way excellent horses, and well-skilled "whips". The Four-in-hand Driving Club and the Coaching Club, established in 1856 and 1870, are aristocratic associations whose members, during the London season, show off in Hyde Park some of the finest horseflesh in the world. We now turn to polo and golf. The former, a kind of horse-back hockey, is an old Oriental game, revived in this country about 1870, since which time many polo-clubs have been formed, the leading one being that at Hurlingham, on the banks of the Thames in Fulham parish, near London. Golf, a still more modern sport in England, travelled southwards from the home of its invention and national adoration beyond the Border. The driving of a ball, with clubs or sticks of various artful shapes at the head, from hole to hole over extensive ranges of ground on large commons, downs or links, is the main feature of the game, which needs much skill, strength, and endurance for success. In Scotland, the sport was fully established in the fifteenth century, and has ever since been eagerly followed. About 1880 it began to appear in England, and is now largely pursued by the middle and upper classes.

If horse-racing be the "sport of kings", as some enthusiast once declared, yachting is the right amusement for the wealthy dwellers in a sea-girt land. Of steam-yachts notice has already been taken; it is the white-winged craft, from the tiny cutter to the noble schooner of some hundreds of tons burden, that most delight the true Briton. There were royal yachts in Elizabethan and Stuart times, but the first known sailing-club in the British Isles was founded, in 1720, at Cork. It was not till the nineteenth century that many yachts were afloat, the club now known as the Royal Yacht Squadron having been founded, in 1812, by about fifty yacht-owners at Cowes, on the north side of the Isle of Wight. There are now above forty "royal" or "recognized" yacht-clubs round our coasts, eight being in Ireland and ten in Scotland. Most of these have been founded since 1840. Among the chief English associations are the Royal Thames, established in 1823, and the Royal London, started in 1838. The leading Scottish clubs are the Royal Northern (1824), with head-quarters at Rothe-

say, in Bute, and the Royal Clyde, founded in 1856. A healthy rivalry, since 1851, has existed between British and American yachtsmen. In that year, the famous New York Yacht Club champion-vessel, the *America*, of 170 tons, beat all our best craft in a race round the Isle of Wight, and our yacht-owners at once turned their attention to the schooner-rig of the successful competitor, with the flat, instead of bulging, setting of her sails and long hollow lines forward. The cup won by the *America* was set apart by Commodore Stevens, her owner, on his death in 1856, as "a perpetual challenge for friendly rivalry", but we have never succeeded, with efforts made by the *Cambria*, in 1870, the *Livonia* in 1871, the *Genesta* in 1885, the *Thistle* in 1887, and by subsequent "flyers", in causing the prize to come back to our shores. So great has been the development of this costly, delightful, and invigorating pursuit, that the number of British yachts has increased from about 500 afloat in 1850 to about 4350, of some 200,000 tons in all, in 1897.

Athletic sports are a subject so closely allied to that which has just been treated, that we have already mentioned, under the head of amusements, much that requires exertion of an arduous character. The noblest of our national, and colonial or, at least, Australian games is still cricket, and this, in its general acceptance and present form, belongs to the nineteenth century. Its origin is obscure, but good evidence favours the view that its invention is wholly English. There was a match between Kent and All England in 1746, and the Hambledon Club, founded at a small village in Hampshire, in 1750, was very active in promoting the game in various parts of the country. Near the close of the eighteenth century, the third stump was added to the wickets, and the famous Marylebone Club, founded in 1787, was established at its present quarters, St. John's Wood ("Lord's cricket-ground") in north-west London, in 1814. For details of the growth and history of the game we must refer our readers to one of the many interesting special books that have appeared during recent years. Becoming rapidly popular, between 1825 and 1850, with the middle and upper classes, the county-clubs, with the best of which all are familiar, were gradually formed, from Sussex, in 1842, to Gloucestershire and Derbyshire, in 1870. In 1859, international cricket began when George Parr, the famous Nottinghamshire batsman, took out a team to the United States.

In 1861, H. H. Stephenson, a great Surrey professional, took out an eleven to Australia, and our cousins there, as we were to learn in due time, acquired great proficiency. Australian cricket will be noticed under the head of those colonies, and we here refer only to the first visit of an Australian team to England in 1878, when the "demon-bowler", Mr. Spofforth, astonished our best batsmen by his all-conquering style, especially marked by perplexing variations of pace. We need scarcely say that the great game, like the British Flag, has gone the round of the world, and is played wherever two elevens can be formed, regardless of climate and other obstacles.

Cycling has also an obscure origin. Three-wheeled vehicles for single riders, worked with the feet by treadles, and called "velocipedes", were in vogue about the middle of the nineteenth century in this country. The bicycle, in its present form, with the indiarubber wheel-tyre, an English invention, began about 1870, and was soon followed by the tricycle. The advance made has been, literally and figuratively, so rapid, that we have riders on the bicycle completing a mile in less than 2 minutes, 26 miles well under the hour, 50 miles in about 2 hrs. 6 mins., 100 miles in 4 hrs. 15 mins., and the 900 miles from Land's End to John o' Groat's House, in the extreme north-east of Scotland, in just over 3 days. The bicycle and tricycle are used, with great enjoyment and advantage, by all classes of society, and are of very great service in business-affairs, with a beginning of use in military matters. More than half-a-million of machines are now in existence, and, in this country, a most important manufacture of the vehicles has arisen at Coventry and elsewhere, with countless clubs, and a literature of cycling publications, weeklies, monthlies, annuals, handbooks and road-books. Special clauses in statutes regulate the use of these valuable machines, which are now, in 1895, being employed by tourists, on the largest scale, in going round the world, so far as solid earth beneath the tyres supplies the means of such transit. Ladies without number have taken up cycling, and international racing is fully established.

Tennis, a game of French or Italian origin, as played in closed courts, was known in England in the fourteenth century, and is still in favour amongst the aristocracy and army-officers. The chief modern, popular form of this game with balls and racquets is

lawn-tennis, introduced about 1874, with the familiar chalk-marked courts and central cross-net. Racquets and fives, played in three-sided open courts, are greatly in favour at the public schools. Archery, once the English mode of winning battles against great odds, became a modern sport towards the close of the eighteenth century, the Royal Toxophilite Society having been formed in 1780. More than a hundred archery-clubs exist in the kingdom, with ladies as their prominent supporters. In Scotland, the Royal Company of Archers, formed at least as early as 1676, are the sovereign's bodyguard north of the Border, with a nobleman of high rank, the Scottish "Gold Stick in waiting", as captain-general. This body heads the clubs of Scotland whose members practise archery as a pastime.

The revival of gymnastics arose in Germany in the last quarter of the eighteenth century, and these exercises were adopted, in France, for military use, about 1845, in imitation of the practice in the Prussian army. In 1860, after gymnasia had been opened at Oxford and elsewhere, military gymnastics came into English use, with apparatus consisting of Indian clubs, dumb-bells, horizontal and parallel bars, trapeze-bars, iron rings hanging by ropes from the roof, vertical and horizontal ladders, climbing poles and ropes. These institutions are used with great advantage both in the army and by civilians. The gymnastic exercise without apparatus is also employed in the army and in schools with very beneficial results, according to the system introduced from Sweden by Mr. Ling.

The development of football in the British Isles, with an almost portentous degree of vigour, and excitement of public interest, belongs to the latter half of the century. The game is very ancient, and in Plantagenet and Tudor times was repeatedly forbidden by royal proclamations, in consequence of the violence used by players, often causing serious breaches of the peace. In the eighteenth century the sport greatly declined, but was always alive, in some feeble form, amongst schoolboys, and became, in Victorian days, a popular amusement and athletic game at the great and smaller public schools, and private academies, and with men of all classes below the highest. The Sheffield and Hallam clubs, playing the non-handling or "Association" game, arose in 1857, and the famous Blackheath Club, with "Rugby" rules and methods, came in 1858, along with a rival club at Richmond. The "Foot-

ball Association", playing the "dribbling", or solely-kicking game, was formed in 1863, and the "Rugby Football Union" followed in 1871. It is needless to dwell upon the present popularity of this international sport, or the frenzied admiration displayed by the spectators, often numbering many thousands at a single game, of this unrivalled British and Irish winter pastime, largely played also in Canada, Australia, and New Zealand.

Wrestling is, as every educated person knows, a truly classical form of human muscular effort. The Olympic Games, the Homeric poems, and ancient statuary, rise at once to the mind in this connection. This old English sport, largely practised, in various styles, by the athletic men of Cornwall and Devon, Lancashire, Cumberland, and Westmoreland, became popular, as a spectacle in other parts of England, about 1825, and for many years annual exhibitions of Cumberland and Westmoreland exponents of the vigorous art took place in London. In 1888 these shows ceased, and the exercise appears to be declining fast in favour of football. Swimming has, of late years, been greatly developed at public schools, and among professionals in the art, with adoption, in some degree, by ladies. There are many competitions for prizes, and the Victorian age has shown such wonderful feats as traversing the Channel from Dover to Calais, a journey performed by Captain Matthew Webb in 1875.

"Athletic sports", in the restricted, popular sense of the present day, as practised in public schools, at the universities, and by athletic clubs, both for amusement and for competition in public for prizes, include running for various distances, with or without hurdles; jumping in width and height; "putting" a 16-lb. weight and throwing a 16-lb. hammer; and leaping with a pole. There are also walking-races, with strict rules as to fair "heel-and-toe" progress. Running, jumping, and throwing the bar or sledge-hammer, were among the old English sports of Tudor times. The modern "athletics" seem to have begun in 1812 at the Royal Military College, Sandhurst, in Berkshire, and the example was followed, early in Victoria's reign, by the Military Academy, Woolwich, and at the great public schools of Eton, Harrow, Rugby, Shrewsbury, and others. It is needless to refer to the present universality of indulgence in these beneficial exercises at every class of public and private schools. In 1853, Cheltenham College set

the fashion of having a grand fête-day for the display of prowess among the students. Two years later, the athletic sports began at the Oxford and Cambridge colleges, and in 1864 the great inter-university contest was instituted. In 1867, the Irish Civil Service sports were established at Dublin. The Amateur Athletic Championship sports, and those of the London Athletic Club founded in 1864, are among the chief displays in this line. There are clubs at nearly every English provincial town of 10,000 or more inhabitants, and many associations of importance in the south of Scotland, apart from the famous semi-professional "Highland Games" at Braemar, Inverness, Aberdeen, and Edinburgh, and the Border Games, at which latter gatherings displays of dancing, and tossing the "caber", a tree-stem twenty feet long or more, are included. During the last thirty years, very great progress has been made in these athletic displays. In 1864, it was a great feat for an amateur to run 440 yards, or a quarter of a mile, in 53 seconds; in 1889 it was done in 48 seconds. The time for running one mile, which in 1864, at the Oxford and Cambridge Sports, was 4 minutes 56 seconds, was reduced in 1884, by Mr. W. G. George, then a famous amateur, to 4 minutes 18¾ seconds. In 1868, three miles were completed, by an amateur, in 15 minutes, 20 seconds; in 1893, Mr. Thomas reduced this time by nearly a minute. At the earlier period, 18 feet was thought a good wide jump; in 1893, Mr. C. B. Fry, of the Oxford University Athletic Club, cleared 23½ feet. The high jump of 5 feet 5 inches, in 1864, at the Oxford and Cambridge sports, was raised, in 1876, by an Oxford man, and in 1880, by an Irishman, to over 6 feet 2 inches. Wonderful feats in running and walking have been accomplished both by amateurs and professionals. In 1886, Mr. W. G. George (then a professional) ran a mile in 4 minutes 12¾ seconds, a feat hitherto unequalled in any country. In 1885, W. Cummings (professional) ran 10 miles in 51 minutes 7 seconds. In 1890, Mr. W. H. Morton (amateur) ran 20 miles in 1 hour 52 minutes 52 seconds. A mile was walked, by an amateur, Mr. H. Curtis, in 1891, within 6 minutes 36 seconds, and by the famous professional, W. Perkins, in 1874, in 6 minutes 23 seconds. In 1881, 8 miles, 172 yards were walked in 1 hour, and in the previous year W. Howes, a professional athlete, completed 100 miles, fair walking, in the marvellous time of 18 hours 8 minutes 15 seconds, or at a sustained

average speed of about 5½ miles an hour. The non-athletic person who endeavours to walk 5½ miles in one hour will appreciate, as he pants and puffs, and utterly fails in this attempted task, the endurance and vigour needed for such a display. The cross-country running, or paper-chases, begun at Rugby School early in the century, have been adopted by many clubs formed in suburban London and provincial towns, and at the two great old English universities. The "Finchley Harriers", of north London, have a great and well-earned repute in this line. At Rugby, 12¼ miles across country have been accomplished in the excellent time, for such work, of under 1 hour 17 minutes.

Rowing, the real fine art amongst athletic exercises, whatever golf-enthusiasts may vainly affirm, or, at any rate, ranking with cricket in its need of skill for proficiency, is another sport suggesting classical allusions. In modern days, as regards its development for racing, it is almost wholly British, and of the later Georgian and Victorian times. The oldest race still open to competition is the annual contest for "Doggett's Coat and Badge", instituted in 1719, for watermen's apprentices, by a London comedian of that name. The earliest professional sculling-race on record was in 1831, for the championship of the Thames, the distance rowed being from Westminster to Putney. In 1847, the course for these matches was changed to the water between Putney and Mortlake, the chief opponents being often men hailing from the Thames and the Tyne. Colonial scullers at last began to compete with success, and in 1876 J. Sadler, of the Thames, was obliged to cede the championship to the Australian Trickett. Then came Hanlan, of Toronto, in Canada; W. Beach of Sydney, and W. Searle of Sydney, and, since the death of Searle in 1889, the possession of the first place among professional scullers has fallen to Stansbury, of Australia. The Amateur Sculling Championship belongs to the holder of the trophy won in a race on the Thames, from Putney to Mortlake, established in 1830, and known as the "Wingfield Sculls" competition. Early in the century, there was six-oar and eight-oar racing at Eton and Westminster Schools, and in 1815 Oxford University started the eight-oar "bumping" College-races, which arose also at Cambridge about the same time. By successive improvements, the use of outrigged boats, keelless boats, and sliding-seats came in. The greatest of all amateur boating contests for

rowers, the Oxford and Cambridge Universities' race, began in 1829, on the Upper Thames, near Henley. In 1836, another race was rowed between eights of the same competitors, from Westminster to Putney. In 1845 the Putney to Mortlake course was adopted, on which, in 1856, the contest became annual. The most remarkable events in connection with this very popular match have been the sinking of the Cambridge boat, swamped by taking in water on a rough day, and by wash from the steamers coming up too close, within a short distance of the winning-post at Mortlake, in 1859; the nine successive victories of Oxford, from 1861 to 1869 inclusive; the five successive victories of Cambridge, from 1870 to 1874 inclusive; the dead-heat of 1877; the eight successive victories of Oxford from 1890 to 1897 inclusive; and the wonderful victory of Cambridge in 1886, by nearly one length, when her boat had been two lengths in the rear at Barnes Railway Bridge, about three-quarters of a mile from the winning-post, the only occasion in the history of the race when so great a lead there has been lost by either crew. Among public schools, Eton takes the lead in rowing, and, along with the two older Universities, leading rowing-clubs are, on the Thames, the Leander, the London, the Thames, and the Kingston, containing many former members of Oxford and Cambridge University "eights". Around the coast, there are countless sea-rowing, as well as sailing, regattas. The most popular meeting on inland waters is the Henley regatta, on the upper Thames, founded in 1839, and now occupying three days in the earlier part of July. There are eight-oar races, as the Grand Challenge Cup contest, open to the world; four-oar contests, as the Stewards' Cup; the Ladies' Plate, for school and college eights; the Silver Goblets, for pairs of oarsmen; eight-oar and four-oar races for second-class crews; and the famous Diamond Sculls contest, for single scullers. In 1892 this contest was, for the first time, won by a foreigner, in the person of Mr. Ooms, of Amsterdam. In fine weather, the scene on the Henley course is one unrivalled for gaiety in the world of innocent frivolity and fashion, with its modern adjunct of gaily-decked "house-boats", all flowers, flags, flirtation, and fun; its aquatic picnics, its brightness, colour, excitement, and glee.

In a record of combined amusement and athletic sport, there is one of the most arduous and heroic, or, as some affirm, foolhardy character, that must not be forgotten. The mountaineering exploits

of members of the world-famed Alpine Club might sometimes be classed with the feats noticed in our account of travel and exploration, but the cheerful readiness with which these daring and hardy climbers risk their necks on slippery places forces us to suppose that their work is regarded by them as mere pastime. The first man who reached the top of Mont Blanc, as an amateur ascender of lofty heights amid ice and snow, was the Swiss natural philosopher, Horace Bénedict de Saussure, who made the journey in August, 1787. The clever and versatile Albert Smith made the ascent in 1851, and founded thereon one of the brightest and most amusing of modern entertainments, a lecture, illustrated with views, and varied by rattling "topical" songs of high character, opened in the following year at the Egyptian Hall, Piccadilly, in London, and still remembered with pleasure by middle-aged persons who went to see and hear his famous "Ascent". The Alpine Club arose in 1858, and mountaineering soon became the fashion with muscular Christians of the most varied tastes and pursuits. Real discovery for the world was effected in regions above the snow-line; the peaks of the Alps, many of which had been deemed inaccessible by the boldest native guides, have all been conquered; and the non-climbers can behold, in photographs of exquisite skill, scenes which make them shudder to contemplate as traversed by human beings. There have been many fatal accidents, but proper use of the rope, the alpenstock, and the ice-hatchet; due watching of the weather; accumulated experience as to proper times and seasons, improved equipment in boots and other apparel, have greatly diminished risks for the prudent climber. Among the great achievements of the Alpine Club, as first ascents of mountains, have been that of the Matterhorn (Mont Cervin, in French) in the Pennine Alps, in 1865; of Elbruz, in the Caucasus, 1868; of Cotopaxi and Chimborazo, in the Andes, by Mr. Edward Whymper, the hero of the Matterhorn, in 1879–80; and of Mount Cook, in New Zealand, in 1882. Of late years, many ladies have made perilous and arduous Alpine ascents.

CHAPTER XV.

LEGAL REFORMS. ADMINISTRATION OF JUSTICE.

Reform of the penal code—Transportation and penal servitude—Public executions abolished—Employment of convicts—Diminution of serious crimes—Reform in prison management—Treatment of juvenile offenders—Reforms in the civil law and in the law-courts—Insolvent non-trading debtors—The law of bankruptcy—Establishment of county courts—Small-debt courts.

For many years after the opening of the nineteenth century, the criminal code of Great Britain was the most cruel one found among civilized nations. Petty thieves were hanged for stealing goods in a shop, or from the person, to the value of five shillings, or for taking property from a house worth 40*s.* or upwards. It was death, by law, to counterfeit the government stamps placed on packets of perfumery and hair-powder; or to rob a rabbit-warren, or to cut down a tree on another man's property. Nominally, there were above two hundred offences punishable by death, though, in practice, only about twenty-five were thus treated. It is almost needless to state that, when wise and humane men agitated for a change in this barbarous system, the highest judicial authorities vowed that no man's property would be safe, that the foundations of society would be loosened, and that none but "revolutionary" persons would suggest anything so absurd and monstrous as any alteration in the laws touching crime. The great philosopher and jurist, Jeremy Bentham, had already, in the later years of the eighteenth century, written powerfully on the theory of punishments, their kinds and effects, their true objects, and the conditions under which those objects could be attained. His general views were adopted by James Mill and other able men, and, on this subject of penal legislation, notably by the excellent Sir Samuel Romilly, who took up the matter in the House of Commons about 1808. He persevered in face of frequent rejection, in one House or the other, of his bills for reform of the criminal law, and, until his death in 1818, he was the chief pioneer of progress in this direction. Sir James Mackintosh, the great politician and philosopher who, in his *Vindiciae Gallicae*, written in favour of the French Revolution, had encountered with great effect Burke's hostile *Reflections* on the same series of events, became the bold and able

champion of the cause long sustained by Romilly, and, with the aid of Sir Robert Peel, he gained much success. In 1823, by five separate Acts, about one hundred felonies were exempted from capital punishment, and Peel, as Home Secretary, further reduced the number of offences thus visited. Between 1832 and 1837, various statutes made forgery of all kinds free from the death-penalty, and, at the opening of Victoria's reign, murder alone was, practically, liable to this punishment. An Act of 1861 leaves but four crimes legally so liable, viz., treason, piracy with violence, murder, and incendiarism committed in dockyards or arsenals. In Scotland, the capital offences were, for a long period of the nineteenth century, murder, robbery, rape, housebreaking, and wilful fire-raising. A statute of 1887 leaves the death-penalty there only for murder and certain attempts thereat.

Under the old criminal system, the death-penalty was very frequently remitted, as a thing too monstrous for infliction in petty cases, and the punishment was then changed to transportation beyond the seas. This punishment was very unequal and inconsistent in its action. Some suffered very acutely, and others, at the penal colonies, became rich men under the new conditions of life in Australia. In 1834, nearly 5000 persons were sent out to those settlements, but a gradual diminution of this deportation of criminals began in 1844, and a more rapid decrease, after 1852, ended in the abandonment of exile to the Australian colonies in 1867. Various statutes, passed between 1853 and 1864 made penal servitude for various terms, passed in convict-prisons within the British Isles or in Bermuda, the punishment for grave crimes not liable to death. Many changes and improvements have also taken place in the methods of dealing with convicted criminals. As regards the infliction of death by hanging, it could make no difference to the sufferer whether the rope were placed round his neck, and the scaffold-bolt pulled, in presence of ten, or fifty, or a thousand spectators, but the system of public execution was found to create scandalous scenes among the crowds who witnessed them, and in 1868 an Act restricted the place of death to some spot within the prison-walls, and the witnesses thereof to the sheriff, the gaoler, the chaplain and the surgeon, with such other prison-officers, or spectators from the outside, as the sheriff might allow. The loathsome spectacle presented by the demeanour of a jesting, half-drunken,

partly-criminal, all-debased, mob around the scaffold, while the air reeked with the smell of strong drink, and rang with filthy jokes and blasphemy and oaths, had been reprobated by those great masters of humour and satire, Barham, Thackeray, and Dickens, and the cessation of a grossly demoralizing publicity in the law's sternest infliction was a relief to all decent and sensible persons.

A complete revolution has taken place both in the theory and the practice of imprisonment as a penalty for crime. The old idea and methods sought simply detention of the criminal and revengeful inflictions for violated law. The modern reformer aims, through punishment, at amendment of character and restoration to a better way of life. So obstinate is wrong in its clinging to existence that not until 1857 was the last hulk or prison-ship abolished, and then only through its destruction by fire. On these dismantled men-of-war, lying at various naval ports, the criminal inmates were herded together without any attempt at classification or division according to age or degrees of demoralization, and the well-inclined were soon brought down to the lowest level. Early in the nineteenth century, an attempt at a better system came with the opening, in 1821, of the costly "Penitentiary", or Millbank Prison, at Westminster, with solitary confinement for 1100 prisoners, whose cells were all under the governor's view from a central point. This place was finally closed as a prison in 1886, and has now been demolished to make room for Mr. Tate's art-gallery and other signs of advancing civilization. In 1842, a like establishment, for about 500 prisoners, was opened in the Clerkenwell district of London, as the *Model Prison*, or Pentonville Prison, from a local name. Strict separation, with moral training and industrial employment, formed the basis of the treatment there adopted. In 1847, the employment of convicts on useful public works, mostly in the open air, was adopted at the new Portland Prison, and, between 1850 and 1857, like great establishments for prisoners sentenced to penal servitude were created on Dartmoor, and at Portsmouth and Chatham. The breakwater at Portland, with the vast fortifications commanding the harbour; the enlargement of the dockyards at Chatham and Portsmouth, and the construction of forts, with other naval and military works, are all mainly the outcome of convict-labour, which has had the further advantage of teaching to prisoners, not only habits of industry in themselves morally elevating, but modes of labour enabling them

to find honest employment after their release. The ticket-of-leave system, introduced in 1857, provides for the remission of a part of a prisoner's sentence, amounting to a quarter of the whole term at the most, in accordance with the number of marks daily earned by industry and good conduct. In this way, the authorities seek to combine deterrent severity of discipline with training in self-control and the reforming influences of religious teaching and good example. Those who have not been formerly convicted are kept aloof, as a separate body, with a distinctive badge, from the older hands in crime, so as to avoid the mutual contamination that, under the former unclassified mingling of prisoners, produced effects so serious to themselves and to society on their return to a state of freedom. The prisons for convicts undergoing penal servitude are strictly supervised and inspected by the Directors of Convict Prisons, and, independently, by committees of magistrates selected by the Home Secretary. The conduct of prisoners of this class is, as a rule, very good, and their judicious treatment is shown by the fact of the death-rate reaching only 10·5 per 1000 in an average of some years. The grand and most gratifying fact in connection with the records of crime of the more serious class is the enormous diminution which has occurred during the Victorian period. In 1837, over 4000 (four thousand) persons were transported; in 1842, nearly 4200. In 1869, the number of persons in Great Britain sentenced to penal servitude (the equivalent, under the new system, of transportation) had sunk to 2219, or little more than one-half. Twenty years more pass away, and in 1889 the number was more than halved again, reaching only 1039, and sinking, in 1890, to 828. The effect produced upon the mind by these startling figures is enhanced by the remembrance that the population of Great Britain (England, Wales, and Scotland) has risen from about 18½ millions in 1841 to above 33 millions in 1891. In other words, while the population has nearly doubled, the amount of serious crime has become less than one-fifth of that found to exist fifty years before. In Ireland, the sentences of penal servitude declined from nearly 200 in 1869 to 83 in 1889, after a decrease in population from 5½ to 4¾ millions.

Dealing now with the prisons for minor offenders, we have seen that, in the last quarter of the eighteenth century, the benevolent and energetic John Howard, in whose honour a statue was, in 1894, unveiled at Bedford, began the movement for reform of

prison-abuses, including great cruelty and neglect. It was many years, however, before anything of real importance was effected. In 1818, there were 518 prisons in the British Isles, to which more than 100,000 (one hundred thousand) persons were committed during the year. In defiance of statutes which had been already passed, only 23 of these prisons were so arranged as to permit the classification of prisoners according to the gravity of their offences. There were about 60 in which males and females were placed together, the statute-law for separation not being passed until 1835. In nearly all these places of confinement, there was no employment; and in 100 there was excessive overcrowding. Reform came with statutes passed just prior to and after the opening of Victoria's reign, and, as we have seen, the Pentonville Prison commenced a new system which was soon adopted in the reconstruction and re-arrangement of county prisons and borough jails. The Prison Act of 1865 provided an uniform code of rules as to diet, labour, and other points, and the culmination of prison-reform came in 1878, when the control of all local prisons passed into the hands of the government, represented by special royal commissioners. Many jails had become useless for lack of prisoners to put in them, and one consequence of the new measure was that the number of local prisons in England and Wales has been reduced from 113, in 1878, to 58; in Scotland, from 57 to 15; and in Ireland, from 38 to 22. With this class of offenders, a system of employment, and improvement in treatment for industry and good conduct, is fully established in four successive stages. The prisons are visited at least monthly by inspectors ready to hear complaints both from officers or warders and from offenders under punishment. The improvement as regards crime of a minor class has been very great. The prisoners of this category, in 1878, exceeded 21,000; in 1890, with a large increase of population, they were but 14,000, or one-third fewer. Since 1883, many jails have been closed for want of prisoners, and in the year 1894 the male-convict prison at Woking, in Surrey, having been empty for some years, was turned to good account as a military barracks. The authorities at the Home-Office attribute the continual decrease of the prison population, and the abandoning of one jail after another, mainly to the effects of education. Between 1875 and 1890, while the population increased by about 25 per cent, the number of convictions for minor offences

was lessened by about 13 per cent, and the number of the criminal classes, in the same period, was diminished by more than one-fifth. The minor criminal administration, apart from the police, who have been already noticed, has been improved by the appointment of stipendiary magistrates in many large English provincial towns, and, in Scotland, under an Act of 1887, by changes in the Sheriffs' Courts which there deal with all offences not liable to the punishment of death, or of imprisonment exceeding the term of two years.

In dealing with juvenile offenders, or, in England and Ireland, persons under the age of sixteen years, excellent results have been attained under the system which allows the young convicted person to be sent, after a very short term in jail, to a "reformatory school" for not less than two or more than five years. The Parkhurst Reformatory, erected in the Isle of Wight, under an Act of 1838, was the first official institution that sought to rescue beginners in crime by special treatment. The Act of 1854, establishing the reformatory system just mentioned, led to the existence, by 1890, of 62 schools of that class, including 3 ships, in the British Isles. Ten of these were in Scotland, and 7 in Ireland. In 1881, there were 6738 juvenile offenders in these institutions. At that time, the Education Act of 1870 was beginning to tell its tale, and a steady decrease of juvenile committals began. At the end of 1890 there were 5854, of whom less than 5000 were actually in the schools, the remainder being out on license. Taking a longer period, we find that the number of juvenile offenders committed to these reformatory-schools in 1856 was nearly 12,000 (twelve thousand), whereas in 1890, in England and Wales, only 3456 boys were thus sentenced. Industrial schools, first appointed by law in 1854, receive children under 14 years who have not been convicted of crime, but are sent thither by magistrates for begging, or as being wanderers without settled abode or proper care and visible means of subsistence; or as children of criminal parents, and consorting with thieves. Children under 12 may also, under certain circumstances, be sent to these excellent institutions, of which there are about 150 in Great Britain, including 8 ships, and some "truant-schools" for school-board cases of children over 5 years and under 14, whose education is habitually neglected by their parents. Here we have a steady increase of children under beneficial detention; the higher numbers representing the increased vigilance in securing

"waifs and strays" on the part of school-board officers and the police.

The reforms in the civil law, during the period under review, have also been of great importance and advantage in many respects. Since the beginning of the Queen's reign, partly by the aid of the energetic, versatile, and eccentric Lord Brougham, in addition to beneficial changes in the law of evidence, many of the perplexing and needless differences of procedure in the Court of Chancery and the Common Law Courts have been assimilated and reconciled. The delays and technicalities which once harassed, impoverished, and maddened litigants who sought relief through the misnamed "equity" system have been, to a large extent, lessened and simplified, and the scandals attached to the Court of Chancery, as depicted; with little exaggeration, in Dickens' *Bleak House*, have been swept away by the advancing tide of reform based alike on reason and justice. In 1843, Lord Denman, Chief Justice of the Queen's Bench, carried an Act allowing, for the first time, the persons directly interested in the result of an action or suit to become witnesses in the cause. The mere statement of such a change being needed is a revelation of the revolting and idiotic absurdity attached to the old methods which, of course, those who uphold things existent, merely because they do exist, maintained to be the essence and perfection of human wisdom. In 1851, another beneficial statute rendered parties to almost all civil proceedings in a law court not only competent, but under compulsion, to give evidence. The Common Law was reformed by three Procedure Acts, improving its machinery, extending its remedial powers, clearing away its technicalities, and removing many abuses. For much of this valuable work British subjects are indebted to the shrewdness, able support, and energy of such eminent judges and lawyers as Sir John Jervis, of the Common Pleas; Lord Bramwell, Sir Alexander Cockburn, Mr. Justice Willes, Mr. Baron Martin, and Mr. W. A. Walton. The great reforms, in the way of simplification and quickening and cheapening of procedure, effected in the Court of Chancery, during the Victorian age, are due to the exertions of the Council of the Incorporated Law Society; of Lord Chancellor Cottenham and other holders of his high office; of Lords Langdale and Romilly; of the eminent judges Sir J. Knight Bruce, Mr. Justice Crompton, Lord Justice James, Vice-Chancellor Parker, and Sir

George Turner; and of Mr. Edwin Field and Mr. W. Strickland Cookson. The Courts of Admiralty, Probate, and Divorce have also been brought into harmony with the principles and procedure of Common Law, and the almost inconceivable absurdities existing in connection with the Court of Arches and other ecclesiastical feudalisms at Doctors' Commons, mocked at by Dickens in *David Copperfield*, have been swept away. In 1873, a revolutionary change came in the Judicature Acts of 1873–76 which constituted the English Supreme Court, comprising the High Court of Justice, with a Chancery division, and a Queen's Bench division; and the Court of Appeal. Lords Selborne, Cairns, and Coleridge, and the eminent Master of the Rolls, Sir George Jessel, were the chief agents in effecting this salutary reform in legal administration, which brought the old maxims of Common Law into closer agreement with the larger and more liberal principles of equity, again improved and simplified procedure, and brought the superior courts into closer connection, so as to enable any tribunal which is oppressed with too much business to transfer a part thereof to other courts, and so clear off the arrears which may be blocking up for suitors the avenues of justice. In 1882 the Courts were finally removed from their ancient abode at Westminster Hall, on the opening of the new Royal Courts of Justice in the Strand. The old Courts of Exchequer and of Common Pleas ceased to exist, being merged, along with the old Queen's Bench Court, in the new Queen's Bench division of the High Court of Justice. It is satisfactory to know, on the highest authority, that it is now impossible, in the strictest literal sense, for any honest litigant in the Supreme Court of this realm to be defeated by any mere technicality, any slip, or any mistaken step in the conduct of his case. The Probate, Admiralty, and Divorce Division has an independent jurisdiction over the matters belonging thereto. Before passing to some other legal reforms, we may mention that, in Scotland, the Judicature Act of 1825 made many important changes in the procedure of the superior courts; the jury court was abolished as a separate judicature, and united with the Court of Session. Mr. George Joseph Bell, a great master of commercial jurisprudence, Professor of Scots Law in Edinburgh University, was the chief agent in promoting and preparing this measure. In 1830, the President of the Court of Session became also the head of the

High Court of Justiciary, the chief Scottish tribunal for criminal proceedings, with an appellate jurisdiction for cases sent from lower criminal courts, but with no appeal from itself even to the House of Lords. The Criminal Procedure Act of 1887 made all the judges of the Court of Session also members of this supreme criminal court.

Under the old legal system, nothing could be at once more cruel and absurd than the procedure adopted with regard to insolvent debtors. In the early part of the nineteenth century, the English law on this subject assumed that insolvency was a crime, and the non-trading debtor who could not pay was sent to prison, there to remain, unable to earn money for the benefit of his creditors, and made to suffer hunger, ignominy, and other discomfort, as a kind of revenge upon his person for the failure of his purse. The life of these mostly unhappy, incarcerated persons, with the debasing idleness and dissipation of hardened insolvents, has been painted for us in colours lurid and true in the *Pickwick Papers*, as concerns the old Fleet Prison, in the City of London, and, for the Marshalsea, in Southwark, on the Surrey side of London Bridge, in the pages of *Little Dorrit*. Dirt, starvation, disease, and burning disgrace were the portion, in the "good old times", of the debtors who, in many a common jail, were placed in company with the thief and the murderer. In the period of fourteen months from October, 1838, to December, 1839, nearly 4000 persons were arrested for debt in England, and 360 of these became permanent prisoners. From time to time, special Insolvent Acts gave some relief to non-trading debtors who disclosed their means and gave up all their property for payment of their liabilities, and then, until 1861, an Insolvent Court for that class of persons existed to hear their petitions and free them from imprisonment on the above terms. Soon after the beginning of Victoria's reign, arrest for mere debt was abolished, and imprisonment in execution of final judgments against debtors came to an end in 1869, except in the case of one who is able but refuses to pay.

In the earlier decades of the century, trading insolvents were also dealt with under bankruptcy laws which treated inability to pay as a criminal offence. The trader's property was all summarily seized, and sold for the benefit of his creditors; on the other hand, the bankrupt was for ever freed, on a certificate granted by the

Court, from liability for all past unsatisfied claims. The state of the law on bankruptcy was then so monstrous that the greatest merchant, perfectly solvent, might find himself, on the *ex parte* secret process of an enemy, who risked the perjury of a false *affidavit*, pilloried in the pages of the *Gazette*. At the same time, there was a trader in 1825 who was made bankrupt on a sworn statement that he had denied himself to a creditor. He resisted this proceeding at law, and, thirteen years afterwards, when £170,000 worth of his property had been taken possession of, and £50,000 had been spent in costs, his general creditors had not received one farthing, and the original question, as to whether he had really, or had not, refused to see a creditor, remained yet undecided. It is impossible to conceive anything more wrongful than such a proceeding as this, but we may be sure that there were many persons, lawyers and laymen, who stoutly affirmed that, whatever you did, you must not by any means meddle with the law of bankruptcy. All this wicked folly has been now swept away to the limbo of things abolished from the world of fact. The Bankruptcy Act of 1883 made an end of the special Bankruptcy Court, and gave jurisdiction in all cases, traders and non-traders alike, to the High Court of Justice, under charge of a judge and officials called registrars. In the provinces, the County Courts, to be shortly noticed, settle bankruptcy matters. The new law is much more severe than the old against persons who are reckless or dishonest, rendering them liable to imprisonment for misdemeanour, and is also much more effective in protecting the interests of creditors. In Scotland, imprisonment for debt was abolished in 1880, except in case of taxes, fines, and penalties due to the Crown, and of lawful rates, and money assigned as "aliment" for persons legally entitled to support. Further restrictions on this imprisonment were enacted in 1882.

One of the most beneficial legal reforms of this reforming century came in the establishment of County Courts. That law, in cases of high importance, has not been made cheap, and remains a luxury for the wealthy to indulge in, is a truth brought home, in daily experience, to the minds of many litigants. The excellent institutions now named, with which the great body of the people are familiar, belong wholly to the reign of Queen Victoria. They came into existence in 1846, as tribunals affording a cheap and

speedy mode of recovering debts under £50, and they have since acquired, under various statutes, a very great development of jurisdiction in civil cases involving questions of law and equity. There are now about sixty of these useful tribunals, dealing with the disputes and claims which arise in 500 districts, including bankruptcy matters outside of the London district, and a simple and rapid procedure has, in a vast number of minor cases, important to the parties concerned, at last brought cheap, swift, and effective justice to the doors of the whole population of the land. The judges and the legal practitioners at the County Courts have shown themselves remarkably apt and versatile in managing the multifarious business with which they have to deal. In Scotland, the Sheriff Small-debt Court, under an Act of 1853, dealt with claims under £12, and a statute of 1867 has extended this jurisdiction to £50, in cases needing summary proceedings for recovery of amounts due.

CHAPTER XVI.

SANITARY REFORM.

Ravages of scurvy—Vaccination—Abolition of the taxes on soap, windows, and glass—Supply of water to towns—Public and private baths—Sleeping accommodation—Supplies of food—Protection against adulteration—Improved system of sewerage—Noted sanitary reformers—Overcrowding in large towns—Sanitary acts passed—Progress in medicine and surgery—Eminent specialists—Improvements in surgical treatment—Training of nurses—Florence Nightingale and Dora Pattison—Dental surgery—The veterinary art—Decrease in the national death-rate.

The subject of Hygiene, or Preventive Medicine, as regards both personal and public health, is one that was little understood, studied, or regarded by the great mass of the British or any other people in the later Georgian days. Sanitation, in its full extent, would need volumes, or a whole literature of its own, for adequate treatment in its many branches, and we can here only indicate a few chief heads, and give a word of praise to the principal reformers in this behalf. In the eighteenth century, as we have seen, John Howard drew attention to the jails. Captain Cook made the grand discovery that the use of fresh vegetables, or, failing a supply of those, the regular serving-out and drinking of lime-juice, banished from ships that deadly and loathsome pest of

seamen, the scurvy, a disorder arising from impurity of blood. Anson, before the days of Cook, lost 600 men out of 900 from this horrible disease, in a single voyage. Captain Cook, in a three-years' cruise, had not a single death from the former mariners' plague. Inoculation for smallpox was introduced early in the eighteenth century, and vaccination, discovered by Jenner in 1796, and made compulsory for infants in 1867, has saved many thousands of lives from, as well as ameliorated the effects of, an olden scourge of the human race.

Before dealing with the great advances made in medicine and surgery, and with the important special legislation on behalf of the public health, we may note what has been done for personal cleanliness and comfort in our homes in the way of water, air, daylight, sleeping arrangements, food, and the elimination of noxious matters. The abolition, in 1853, of the duty on soap (amounting to as much as 1*d.* to 3*d.* per lb., for different qualities), imposed in 1711, was an important hygienic reform, leaving no class of the population any further excuse for making a fetich of dirt. That abominable impost, the window-duty, taxed for too-submissive Britons the very light and air of heaven that should have been free to all the creatures of God. In 1825, the tax was removed from all houses not having more than seven windows, an arrangement which caused the bricking-up of some needful outlets in order to save the payment. In 1834, a slight reduction of this wicked piece of financial oppression, robbing men of sunshine and health, was made in favour of small farmhouses. Not till 1851 did this villainy vanish amidst the mingled execrations and exultation of all good citizens. The repeal of the excise-duty on glass, in 1845, was another important sanitary measure, vastly reducing the price of the material, and so contributing to health and comfort in countless ways. Many articles of domestic use could at once be made, at a reasonable cost, of this cleanly and beautiful material. Lamps and candlesticks, large plate-glass windows for the rich, small panes for the poor, the balance-springs of costly chronometers, lenses and optical instruments of every kind, the apparatus of lighthouses, were all closely connected with an impost that reached from twice to thrice the manufacturing cost of the taxed article. The sanitary commissioners of the time expressed the opinion that in Ireland, above all, the physical condition of the poor would derive

more benefit from this reduction of price in glass even than from the removal of the window-duty.

An ample supply of water for cleansing purposes, and pure water for drinking, are now fully recognized as prime essentials of health. These requisites have received a great development during the period with which we are dealing. Eight great companies now furnish the people of London with an abundance of water derived from wells and springs, and from the rivers Thames and Lea, passed through filter-beds, stored in huge reservoirs, and conveyed by natural pressure through pipes to the tops of houses, for distribution from cisterns downwards to pumps and taps, either on the intermittent or constant-supply system. The great and small provincial towns enjoy the same advantage, and some of the works of supply are on a most costly and colossal scale. Glasgow now receives water from Loch Katrine by two aqueducts 35 miles in length, including many miles of tunnels from 8 to 9 feet in height, and from 8 to 10 in width, with cast-iron pipes across the valleys, and fine aqueduct-bridges over deep ravines, carrying pipes of wrought iron 8 feet wide and 6½ feet high. Above two millions sterling was the charge for these magnificent undertakings, capable of supplying 110 millions of gallons per day. The method of supplying water to Liverpool presents works on a still more gigantic scale. In 1881, operations were begun at the upper part of the river Vyrnwy, rising on the borders of Merioneth and Montgomery counties in north-central Wales, and flowing into the Severn in the latitude of, and west of, Shrewsbury. The water passes over 67 miles to the reservoirs near Liverpool, partly through three parallel iron pipes, and partly through tunnels, of which one is 2¼ miles long and 7 feet in diameter. The chief work involved in this great piece of modern engineering caused the removal of a whole large village, with its church, schools, and other appurtenances, to a neighbouring spot, in order to make room for the construction of a vast reservoir called Lake Vyrnwy, receiving the waters of the river of that name. This artificial lake, covering more than 1100 acres, is nearly 5 miles long by 1½ in extreme width, and is bounded by masonry of more than Egyptian grandeur. The wall, of enormous stones, sinks 60 feet below the ground, and rises 100 feet above it, while the outfall, at certain times, presents a cataract of stupendous size. On July

14th, 1892, after eleven years spent in preparation, the water was let go on its beneficent journey to the teeming population of south-west Lancashire. Manchester, in 1877, having constructed enormous works to bring water from a dale in north-east Cheshire, found herself already in need of a larger supply, and turned for relief to the Lake district in the north. After long debate, and great opposition from the lovers of the picturesque, who protested that artificial works would spoil the beauty of the scenery, operations were begun, in 1886, for conveying water from Lake Thirlmere, in Cumberland, on the west of Helvellyn, 100 miles away. The aqueduct includes a tunnel 3 miles long, at a depth of 270 feet, with many bridges across rivers, and pipes of from 33 to 40 inches in diameter for taking the water from Bolton to Manchester. The purity of water, as consumed in the household, has of late years been largely promoted by the use of filters of various kinds, either kept in the kitchen or dining-room to prepare the water for immediate use in drinking, or placed in the cistern at the top of the house, above the pipes conveying the water to the taps below.

The increased use of baths in private houses is one of the most notable modern sanitary features. In large and costly structures for human habitation, erected in the earlier decades of the century, a bath-room was unknown; in these later days, no decent dwelling-house, at a rental of £20 to £30 a-year, is left without an apartment so essential. In public baths we are still very deficient. Acts of 1846 and 1847 enabled borough councils and parish vestries to establish baths and wash-houses supported by the rates, and statutes of 1878 and 1880 authorized the establishment of cheap swimming-baths. There are such institutions in London and some other great towns, but only a beginning has yet been made. The modern sleeping arrangements are also a great improvement upon those of our later Georgian forefathers. Heavy carpets, harbouring dust, have departed from most bed-room floors in favour of movable rugs, carpet-strips, and matting. The rooms are more lofty, and, in all good houses, are supplied with ventilators. The old heavy four-post wooden bedstead, dear to vermin that may not be named, and shrouded with thick curtains, has vanished before the cleanly and comely brass or iron supporter of wholesome mattresses which, for the more intelligent sleepers, have replaced the feather-beds of our grandmothers' days. The subject of food

is one too large for aught but allusion here, but we may reckon amongst the sanitary improvements due to steam-conveyance a very much larger and fresher supply of vegetables and fruit from our own market-gardens and from foreign and colonial sources; of milk from our own unsurpassed breeds of cows; and of fish from the teeming waters around our coasts. The law has also, of late years, done much to guard consumers from adulterated and noxious articles. The middle of the nineteenth century had long passed before the law made even an attempt to protect the public, on sanitary grounds, from the shameful corruption of human food in many forms. An Act of 1860 was of little use. Statutes of 1875 and 1879 are those which now guard against the adulteration of food and drugs. In most of the larger English and Scottish towns, public analysts have been appointed, and their action has, beyond doubt, done much to enforce purity in such articles as milk, coffee, and butter. Unsound fish, in the London wholesale market, is promptly seized and destroyed, and heavy penalties, of fine and imprisonment, await the rogues who send up from country districts unwholesome meat for town-consumers. On the day before we write, a London alderman inflicted two penalties, each of £40, on a man who had, after one warning, thus sought to benefit his pocket at the cost of the health of Londoners. A second offence, after conviction, generally brings a sentence of imprisonment with hard labour.

One great source of disease lies in the noxious gases emanating from the matters which, in the non-sanitary times that have only recently passed away, were allowed to fester in cesspools, to defile the air in open drains, to pollute the soil, and so to taint the water obtained from wells. Cholera, typhoid fever, and other terrible maladies have their origin in such conditions of life. It is one of the best-founded boasts of the nineteenth century in the British Isles that we have learned at last one-half of the lesson concerned with sewage. We have at least, in all the larger towns, devised means to remove the poisonous matter from our dwellings. We have yet only to a very small degree learned how to turn it to good account elsewhere, and the value of many millions of pounds is yearly flung away for lack of combined chemical and engineering skill. The sewers for the conveyance of noisome matter to some distant receptacle have been greatly improved by the substitution,

about 1850, of impervious stone-ware drain-pipes, first made by the firm of Doultons, of Lambeth, in South London, for the old flat-bottomed, leaky brick-drains. Since 1860, an enormous improvement has been effected in London by the purification, within the metropolitan district, of the Thames, which was becoming a mere vast open sewer. At the cost of some millions sterling, the Main Drainage Act caused the construction of complete new systems of sewers on both sides of the river, conveying the matter down to two great outfalls, at Barking, in Essex, on the north, and at Crossness, in Kent, on the south. The sewage is chemically treated with lime-water and lime-sulphate, with the addition, in hot weather, of permanganate of soda, before the clarified liquid portion is discharged into the river. The more solid matter, or sludge, is conveyed down the Thames in steamships of special construction, and discharged into the sea in deep water. Inside our modern dwelling-houses, precautions against the evil effects of the sewer-gases have been largely adopted by a system of trapped drains which cut off communication from the outside sewer for these emanations, and by ventilating-pipes carried from the drains to a height above the roof.

We must now see something of what sanitary legislation and sanitary reformers have done for the national health during the last two generations. The causes at work for this result have been the progress made in medical science, the spread of education, and the consequent interest taken by all intelligent persons in all that can promote the national health. A special development of hygienic knowledge has been that which concerns the origin and spread of such infectious or zymotic diseases as typhus and typhoid fevers, cholera, small-pox, measles, diphtheria, and scarlet fever. These serious disorders of the human frame, which cause a very large proportion of the annual mortality, have been traced to living particles called germs, derived from previous cases of the same disease in each instance of propagation. The contest of medical science is therefore directed against the germs, with good results likely to be largely increased. Among the leaders of the sanitary reform which so greatly distinguishes the Victorian age we may first name Dr. Southwood Smith, a native of Martock, in Somersetshire, in 1778, and a student of medicine at Edinburgh. In 1825 he became physician to the London Fever Hospital, and,

after great experience in the wards of that institution, and at the houses of the poor, he wrote, in 1830, a Treatise on Fever, which made an epoch in the history of such forms of disease. His Report on Fever in Twenty Metropolitan Unions was also very potent in calling attention to the scandalous prevalence of disorders susceptible of prevention or of great diminution, and in suggesting remedial agencies. Another great name in this connection is that of Sir Edwin Chadwick, born near Manchester in 1801, and living, with great advantage to the community, until 1890. Devoted from early manhood to sanitary and social affairs, this very able and energetic reformer worked for twenty years, on the Poor-law Board and the Board of Health, against the evils of overcrowding, uncleanliness, and neglect of due precautions against the rise and spread of contagious and infectious disease. On his retirement from office in 1854, his mantle fell on his future biographer, Sir Benjamin Ward Richardson, born in 1828 at Somerby, in Leicestershire, who graduated in medicine at the University of St. Andrews. This great advocate of total abstinence from alcoholic liquors was the founder, in 1855, of the *Journal of Public Health*, and, in 1862, of the *Social Science Review*, and worked with excellent effect in the cause of public health and sanitary science. Dr. William Farr, F.R.S., a native of Shropshire, in 1807, who lived till 1883, did work of inestimable value in this important field, as an investigator whose achievements appear, to some extent, in the work called *Vital Statistics*, published by his friends after his decease, in order to give his countrymen some idea of the services rendered by this excellent and eminent man during forty years of official labours with the Registrar-general, of which some account has already been given.

The Commission of 1840, appointed by the House of Commons, revealed in its report, after long inquiry, a horrible condition of overcrowding, filth, misery, and disease in Liverpool, Glasgow, London, and many other places. Another Commission, in 1843, made a minute investigation into the sanitary state of fifty large towns, and found that the numberless Local Improvement Acts of half-a-century had done very little for drainage or sewerage in the poorer districts. Slaughter-houses, pigsties, lodging-houses for human beings, greatly resembling the porcine abodes in regard to dirt, were found in the midst of teeming populations. Then came

the Public Health Act of 1848, a great and important statute, marred by the "permissive" character which clings to so much of our legislation when it interferes with the holy "vested interests" which cause neglect of human health and happiness in the many for the sake of greed for money in the few. The machinery of this statute, in the form of a general Board of Health, and local committees of Town Councils, controlling all kinds of nuisances, with a public medical inspector in every district, has long been superseded, but it was a good beginning after the previous utter apathy as to sanitation. In 1858, the Local Government Act gave increased powers to the central authority and the local boards, and there were various Artisans' and Labourers' Dwellings Acts which made feeble efforts to improve the homes of the toilers in towns. At last, in 1875, after the report made by a Sanitary Commission, the Public Health Act amended and consolidated all existing statutes, and a simple, clear, and intelligible code of sanitary law was administered by the Local Government Board established in 1871, having powers previously vested, with confusion as the result, in the Home Office, the Privy Council, and a department of the Board of Trade. All the efforts made by Lord Shaftesbury, who, in 1851, carried the Common Lodging-houses Act and the Labouring-classes' Lodging-houses Act; the Torrens' Act of 1868, and the statutes of 1875, 1879, and 1882, with the Act of 1885, passed after Parliament had received the report of a famous Commission on the Housing of the Poor; have not yet successfully dealt with this very great and difficult question. The Burial Act of 1850, closing metropolitan graveyards, was extended to the English provinces in 1853, and to Scotland in 1856, with the result of ending the scandal of poisoning the living by the interment of the dead in their midst, while it placed cemeteries, in open ground, under due sanitary control. About 500 burial-boards, in England alone, now provide for proper interments, and like arrangements exist in Scotland, under the Parish Councils Act. Thousands of old churchyards have been closed, and large numbers of new cemeteries, in places removed from population, have been brought into use. A fair regard to matters of sanitation now exists under the inspection of medical officers of health and other officials, and in large towns, especially, due measures are taken for the reporting and the prompt isolation,

or removal to a hospital, of every case of infectious disease. The sea-ports are now so carefully watched against the inroads of Asiatic cholera that, in several recent years, when a large mortality has been occurring from that disorder in European countries with which we have constant commercial intercourse, the British Isles have been kept wholly free from invasion.

We turn to some account of the remarkable progress made in medicine and surgery during the nineteenth century in the British Empire. The first salient fact with regard to these formerly distinct branches of knowledge and practice is the extent to which they have now overlapped and commingled with each other. The second is the rise and development of specialism, under which system medical men now largely devote themselves to particular organs of the human frame, and to special diseases connected therewith. The improvement in our knowledge of the human frame is largely due to the Anatomy Act of 1832, which furnished surgeons and students with a fair supply of human subjects for dissection, by allowing them the use, for that purpose, of the bodies of friendless persons dying in almshouses, hospitals, workhouses, or prisons. The horrible trade of the "resurrectionists", men who stole bodies from burial-grounds for sale to surgeons, was thereby stopped, as well as the dreadful form of murder, for the same purpose, called "burking", from the more notorious of two criminals, Burke and Hare, Irishmen living at Edinburgh, who, in 1828, were proved to have drugged and suffocated many victims. The use of the stethoscope, for divining by auscultation the state of the heart and lungs, was an invention of the great French physician Laennec, but its introduction to this country was due to Dr. Thomas Davies, a physician to the London Hospital, whose chief work on the subject appeared in 1835. Sir Charles Bell, born at Edinburgh in 1774, son of a clergyman in the Scottish Episcopal Church, became a great anatomist and surgeon in London. In 1807 he made his discovery of the existence of sensory and motor nerves in the brain, and obtained enduring renown by his revelation of other truths concerning the nervous system. He was succeeded, as an able investigator in this department, by Dr. Marshall Hall, discoverer of the reflex function of the spinal cord, and by Dr. W. B. Carpenter, who did much to further the study of nervous disease. Dr. David Ferrier, a native of Aberdeen, has been great in scientific

work concerning the brain, its functions, and its relations to various forms of disease. Sir William Jenner, in 1851, established the difference between typhus and typhoid fevers. Sir John Forbes, who graduated in 1817 as M.D. at Edinburgh, and then acquired a large practice in London, and became one of the Queen's physicians, did much to promote the use of the stethoscope, and greatly improved the art and practice of diagnosis in disease. Sir James Simpson, a native of Linlithgowshire, who became M.D. of Edinburgh in 1832, won undying fame as the introducer of chloroform in medical practice, sulphuric ether, for deadening sensation during surgical operations, having been previously employed in the United States. Dr. Bright and Dr. Addison made well-known discoveries in kidney disease. Among the many ingenious inventions of the century for the investigation of man's physical condition may be noted the use of the thermometer, in a very delicate form, for taking the bodily temperature; the laryngoscope, a mirror-arrangement for examining the throat; and the ophthalmoscope, for detecting diseases of the eye, an instrument re-invented in Germany, but first due, in principle, to that great mathematical and inventive genius, Mr. Charles Babbage.

The British Isles, during the period now under review, have produced surgical operators of the very highest skill and eminence in the whole history of the art, and one by whom the practice of surgery has been positively revolutionized in the way of preserving countless lives that were formerly sacrificed through the fever and blood-poisoning that followed operations. In the earlier part of the century, Sir Astley Cooper, a pupil of the famous Cline, and of the illustrious anatomist John Hunter, was surgeon to Guy's Hospital, professor of Comparative Anatomy in the College of Surgeons, and a Fellow of the Royal Society. His writings were of high value to the profession which he loved, from the research, originality, and accuracy which they displayed, and his manual work was characterized by much boldness and dexterity. After rising to the position of President of the College of Surgeons, Cooper had his merit recognized abroad by the membership of the French Institute and of the Academy of Sciences; at home by the D.C.L. of Oxford and the LL.D. of Edinburgh. He died in 1841, and was buried in the chapel of Guy's Hospital. St. Paul's Cathedral has a colossal statue to the memory of this great surgeon,

who turned the practice to which his life was devoted from a field of hazardous experiments into an arena for the display of real scientific skill. In Liston and Syme, Scotland may claim to have produced two of the best surgeons of their own or of any time. Both were younger contemporaries of Cooper, Liston being eminent in skilled and rapid operation, Syme, also an unsurpassed wielder of the knife and other instruments, having no equal as an instructor, and being distinguished by his ingenious, cautious, and scientific improvements in his difficult and dangerous art. Robert Liston, born near Linlithgow in 1794, became lecturer on surgery and anatomy at Edinburgh, whence he removed to London in 1835, as professor of Clinical Surgery at University College. Famous throughout Europe as an operator, Liston gained a large practice in London, and in 1846 was appointed one of the Board of Examiners at the College of Surgeons. In 1847 he died, with his reputation at its highest point. James Syme, a native of Edinburgh, born in 1799, was educated at the University of the Scottish capital, and studied anatomy under Liston. In 1833 he became professor of Clinical Surgery at Edinburgh, and then for a time succeeded his former teacher at University College, London. Syme's *Principles of Surgery*, and his lectures, place him first in the foremost rank of teachers. He soon quitted London for his old position at Edinburgh, which he held until his death in 1870. Another Scot, Sir William Fergusson, born at Prestonpans in 1808, became, after a successful early career in Edinburgh, professor of Surgery in King's College, London, and surgeon to the hospital of the same name. As an operator, he proved himself to be a worthy successor of Liston and Syme, displaying a large share of coolness, rapidity, knowledge, and enterprise. In 1870 Fergusson became President of the Royal College of Surgeons in London, and died seven years later, still at the height of his professional repute. In the first medical peer, Lord Lister, born in Essex in 1827, and a medical graduate of London University, we have a man who has justly attained the chief professional posts as a surgeon both in England and Scotland, and has received the high recognition of honorary degrees at the Universities of Oxford, Cambridge, Glasgow, and Edinburgh. It is he who was above alluded to as one who has produced so wide and beneficent a change in the surgical art. In spite of all care in operation, dressing, and subsequent nursing,

numerous fatal issues of surgical practice arose from gangrene, pyæmia, erysipelas, and other developments of blood-corruption due to matter issuing from the wound. Lister was the man who divined both the true cause of, and the right remedy for, the excessive mortality of the putrefactive diseases which followed the action of surgical instruments. In 1865, at the Glasgow Infirmary, he introduced the antiseptic system of surgery which has since been adopted, with marvellous success, by practitioners throughout the civilized world. In this "contest against putrefaction", as the name of the new system signifies, the inventor adopted the method of operating under a cloud of spray, chemically prepared so as to thoroughly cleanse the wound from the moment of the first incision. The hands of the surgeon and his assistants, with all instruments, sponges, and appliances, were also guarded against the possibility of introducing poison into the patient's system, by a like chemical cleansing, and the spray was kept playing on the wound until an impervious chemical bandage was applied. Every fresh dressing was performed under spray, and perfect cleanliness was followed by almost entire freedom from the results of the old carelessness as to the exclusion of poisonous matter coming from the air or from other sources. The spray-system has been since laid aside by many surgeons, without diminution of the good effect really due to Lister's innovation as to absolute cleanliness in the hands and instruments of surgical operators, and in the dressings applied to wounds. As an illustration of the new method, the Franco-German war supplied countless instances of very rapid cures in wounds of every description, treated with nothing but cold-water bandages of perfect cleanliness, with an abundant supply of fresh air to the sufferers under treatment. The modern improvements of surgery include the use of new ligatures for severed arteries. These are composed of some animal material which the patient's body absorbs, in place of the former stout silk threads which retarded healing until they were removed, and the withdrawal of which sometimes caused serious and even fatal bleeding. A remarkable feature in later developments of surgery is the successful audacity displayed in attacking with steel diseased internal organs in both sexes which were previously held to be quite out of reach of manual effort. Tumours on the brain have been removed with success, and diseases of the eye, once surely ending in utter blindness, have

been proved to be absolutely curable. In concluding this part of the subject we may fairly claim for Great Britain that, in this and the two preceding centuries, producing Harvey, Sydenham, John Hunter, and the illustrious men whose work has now been described, we have made advances in medical science, in the way both of preventive and of curative discovery and practice, beyond what has been achieved in all other countries of the world put together. In the present century, the discovery of the functions of the spinal cord by Sir Charles Bell, of reflex action by Dr. Marshall Hall, and of antiseptic surgery by Lister, far outweigh all that has proceeded from foreign countries during the same period.

A debt of gratitude is also due to those who have wrought improvements in the art of curative nursing, and have devoted their lives to the benefit of sufferers in hospitals. The proper arrangement and management of these institutions belong almost entirely to the Victorian age. The vast increase in the number of hospitals for every class of disorder has been already noticed. Wise sanitation now isolates infectious diseases in special wards or buildings, and the position and construction of hospitals, as regards site, free circulation of air outside, ventilation, and other requisites have been radically changed. The internal administration has undergone a complete reform, and, in most cases, all things needful for speedy restoration to health are lavishly provided in these special abodes of the sick and injured. An adequate staff of resident and visiting medical officers direct the operations of the nurses who now do all that organized practical and scientific training can effect to assist nature's efforts towards a cure. The name of Florence Nightingale, already noted in connection with the Crimean campaign, at once occurs to the reader's mind. At the close of the Russian war, this lady was furnished, by public subscription, with the sum of £50,000 for the purpose of training nurses, and the income thus arising is expended on preparing a superior class of these indispensable aids at St. Thomas' and King's College Hospitals. Her *Notes on Nursing* and *Notes on Hospitals* led the way to invaluable changes of system, and her example and influence first aroused the feeling which has brought forth thousands of women from almost every class of society, who, after due training, now render service in every kind of sick-attendance at hospitals, workhouse infirmaries, in private houses of the superior kind, and as district-nurses at

the abodes of the poor. In Ireland, Sisters of Mercy are largely employed in this work. In 1887, the Queen devoted the surplus of the Women's Jubilee Offering, producing an annual interest of about £2000, to the maintenance of central institutions for the support and training of district-nurses. After preparation for their work at one of the central Homes, now existing in London, Dublin, Edinburgh, and Cardiff, the nurses may become members of the "Queen Victoria's Jubilee Institute" and wear the badge of "Queen's nurse". In army and navy hospitals, the nurses are all ladies of good social position, with three years' training in a general hospital, and, being styled "Her Majesty's Nursing Sisters", they are prepared to go out in any war, and may receive, for special service, the Royal Red Cross order. There is now a Royal National Pension Fund which makes provision, in their declining years, for those who, on behalf of their fellow-creatures, have spent health and strength in the unceasing contest against disease and death. We must not fail to mention a lady of remarkable personal charm and character who, inspired by Miss Nightingale's work, became a martyr to these heroic and devoted labours. Dora Windlow Pattison, one of ten daughters of a Yorkshire rector, and sister of the late accomplished head of Lincoln College, Oxford, became, in 1864, one of the "Good Samaritan" sisters at Coatham, near Redcar, on the extreme northern coast of her native county. After a severe training for a religious life, she devoted herself to hospital-work at the Staffordshire town of Walsall, in the "Black Country" of coal and iron. She there won a kind of adoration, as a saint of perfect self-devotion, gentleness, and courage, from the roughest and most depraved persons of both sexes, on whose behalf, with her native vigour entirely spent, she laid down her life in 1878. Weeping thousands, of every class, age, character, and calling, followed her body to the grave, and a monument was erected, some years later, by the offerings of the working-men.

Any account of sanitary progress would be incomplete that failed to note the improvements made in the art of dentistry which concerns the health of human beings, and in the veterinary medicine and surgery which deal especially with the maladies of horses and other animals of great importance to the welfare of mankind. Dental surgery has made amazing progress, due in many points to the ingenuity of United States inventors, in dealing with all dis-

orders of the teeth. Apart from the use of anæsthetics, dangerous in the case of many patients, better instruments for extraction effect their purpose with greater rapidity and less pain. The stopping or filling, and the scaling, of teeth, and the remedies for the agonies of toothache, have made great advances. Countless persons who had partially or wholly lost the natural means of biting and masticating food have been furnished, in mechanical dentistry of marvellous skill and efficacy, with artificial teeth that both in appearance and action go far to replace the loss of nature's apparatus. The public interest has been regarded in legislation which, notably in the Dentists' Act of 1878, provides for the proper training and examination of dental practitioners under the control of the General Council of Medical Education, and proficient candidates in Great Britain and Ireland, after instruction in a dental hospital and school, receive the degree of L.D.S., or Licentiate in Dental Surgery.

It was only after the middle of the eighteenth century that the veterinary art began to rise to the dignity of scientific study and treatment. The eminent French farrier, Claude Bourgelat, a native of Lyons, author of many anatomical and medical works on his own subject, founded in 1761, in his native town, the first veterinary college, and the new school gained such distinction as to attract students from all parts of Europe, and to cause the rise of like institutions in France and almost all other European countries. The two La Fosses, father and son, were very able discoverers and writers of the same period in France. In 1791, the Veterinary College of London, with M. St. Bel, a pupil of Bourgelat, as professor, was founded by the Agricultural Society of Odiham, in Hampshire, and, on St. Bel's death two years later, the professorship was accepted by a young surgeon named Coleman, who was a friend of Sir Astley Cooper, Abernethy, Cline and other eminent men. Under Coleman's direction, great improvements were made in sanitation and in the treatment of some of the more serious diseases of the horse. The institution has since become the "Royal Veterinary College", with a staff of about a dozen professors and demonstrators, and the owners of stock in all parts of the British Empire have derived vast benefit from research and practice, both as to the prevention and treatment of disease. In 1844 the members of the profession who held diplomas or certifi-

cates from veterinary schools were incorporated by a royal charter conferring power to elect 24 members of council, and to appoint examiners. Further powers have been since bestowed with regard to regulating the curriculum of teaching colleges, and the subjects of examinations. The Royal Veterinary College at Edinburgh was founded, in the reign of George the Fourth, by Professor Dick, a former student under Coleman in London. On his death in 1866, Dick left his college in trust, with all his fortune, to the Lord Provost and magistrates, and in 1873 the principal of their appointment, Mr. Williams, founded the New Veterinary College in Leith Walk. The Glasgow Veterinary College arose in 1861. The efficient training of veterinary surgeons is now secured by regulations compelling students to attend a college for three scholastic years, and to undergo three professional examinations at the hands of a board appointed for five years by the "Royal College of Veterinary Surgeons" in London, invested with powers according to the charter mentioned above. The new dignity of the profession whose members were once contemptuously spoken of as "horse doctors" and "cattle doctors" is indicated by the facts that the Principal of the older London institution, at Camden Town, the Royal Veterinary College, is a Companion of the Bath, and that in the army a veterinary surgeon ranks, on admission to the service, with a lieutenant, rising to equality with a major, after a certain term. India, Canada, Australia, and all the chief British colonies now have their own veterinary colleges.

We conclude with some figures that clearly demonstrate the advantage to human life in the British Isles brought about by the sanitary changes that have been described. We have no quite trustworthy details until we come to the time of Queen Victoria's accession, but we give two independent calculations, based upon returns that may be relied on for substantial accuracy. For thirty-five years up to 1870, the annual death-rate, per 1000, for all England, was 22·4. For the six years 1887–88–89–90–91–92, the average annual death-rate per 1000, in England and Wales, was 19. Take London alone, and we find that in 1845, one inhabitant in forty died annually. Forty years elapse, and in 1885, but one inhabitant in fifty-one of the capital is dying annually. In the five years from 1838 to 1842, the average annual mortality in London, per 100,000, was 2557. In the five years 1880 to 1884, the average

annual mortality, per 100,000, had declined to 2101. The meaning of this is that, in each of the five years of the later period, more than 17,000 persons were kept alive in the capital who, in the former unsanitary period, would have assuredly perished. Take the death-rate for England and Wales from 1838 to 1847; it averaged annually 22·16 per 1000. In the six years above given, at 19 per 1000, with an average population of 28½ millions for England and Wales, above 80,000 (eighty thousand) lives were annually saved.

CHAPTER XVII.

TOWNS, OLD AND NEW.

Causes favouring increase of population—LONDON—Its modern extension—Bridges and embankments—Parks—New public buildings—The Tower Bridge. Liverpool and Birkenhead—Manchester and Salford—Leeds, Birmingham, and Sheffield—The cotton-towns of Lancashire—Bradford, Huddersfield, Halifax—St. Helens and Barrow-in-Furness—Rise of towns in the Cleveland district and in Durham—Towns in the Potteries district—Newcastle-on-Tyne and Sunderland—Towns in the Midlands—Nottingham—Hull and other towns on the east coast—Towns in the south and adjoining London—Portsmouth and Southampton—Crewe and Swindon—Bristol—Cardiff, Swansea, and towns in Wales—Plymouth, Chatham. Advantages of reform in municipal government. The "pleasure towns" of England—Cheltenham, &c.—Hydropathic establishments—Brighton, Hastings, Scarborough, and other coast places of resort. Towns of Scotland—Edinburgh and Leith—Glasgow—Dundee and Aberdeen—Paisley, Greenock, Perth—"Pleasure towns" of Scotland. The towns of Ireland—Dublin, Cork, Belfast, and Kingstown.

The vast increase of population in towns old, and the rise and growth of towns new, are due to a variety of causes closely connected, for the most part, with the general progress of Great Britain. The natural growth of numbers in one of the most vigorous and prolific races of people that the world has ever seen; the enormous development of manufactures and commerce, with a corresponding increase of the country's wealth; the easy and rapid communication afforded by steam-traffic; the enterprising spirit and the growth of intelligent curiosity that send men in search of new and desirable places of abode; the spirit of sanitary reform, and the wholesome longing for full draughts of sea-air; the discovery of new sources of wealth in ironstone and coal; all these have played their part in the vast extension of the boundaries of boroughs and cities known to our forefathers, and in causing new centres of population to spring

up and to spread, in some cases with almost magical rapidity of growth, inland and on the coast, to north and south and east and west of England, Scotland, and Wales. In Ireland, from well-known causes, there has been little change of this kind, but even there the genius of a century of unparalleled advance has not failed, in some places, to leave her mark.

To London, the wonder of the world, belongs the place of honour in our rapid review of these phenomena of civilization. Very much of what is here given concerning the capital applies to all the great provincial towns, and no repetition will be needed on the subjects of suburban extension, and architectural improvement, involving the erection of handsome streets, crescents, "gardens", and squares, with detached villas further still from the commercial centres of business and toil, and the construction of grand municipal buildings, law-courts, bridges, docks, museums, galleries, public institutions of every class, many of which have already been noted in this comprehensive record. In 1801, the capital of the British Empire contained less than one million inhabitants. In 1893, the estimated population of the Registrar-general's district, or London properly so called, was somewhat above 4¼ millions, while the "outer ring" or "greater London", which means the Metropolitan Police District, extending far into the counties of Kent, Surrey, Essex, and Middlesex, had in 1891, by enumeration, a population well exceeding 5½ millions. The suburban residences of, not merely the merchants and wholesale traders, but of the wealthier shopkeepers in every line of business, and of persons employed by the commercial heads of houses in all departments of trade and finance, in the public service, and as assistants in professional affairs, have spread abroad to Streatham on the south, to Highgate and Tottenham on the north, to Kew on the west, and to Stratford in the east, in continuous houses ever annexing new conquests over the fair domain of foliage and turf. Much of old London has been rebuilt to meet modern needs of space and sanitation. The bridges erected in the present century include the most famous structure of the kind in cast-iron, Southwark Bridge, with its three fine arches, designed and erected by the elder Rennie, and opened in 1824; the beautiful Waterloo Bridge, of granite, constructed by the same great engineer, and completed in 1817; the grand London Bridge, designed by the elder Rennie, and constructed by his two sons, George and Sir John, opened for traffic

in 1831; the bridges which have replaced the old Blackfriars and Westminster; and the great structure called Holborn Viaduct, carried, at the cost of four millions sterling, across a valley which greatly impeded traffic between the City and the west. The Thames Embankments—the Victoria, from Westminster Bridge to Blackfriars; the Albert, on the south, from the same bridge to Vauxhall; and the Chelsea, on the north side opposite Battersea Park, form the greatest improvements in London during the Victorian age. The first was completed in 1870, and the others followed in due course. During the present century, Hyde Park has been greatly improved; St. James' Park was finished, in its present form, in 1829; the fine Regent's Park was opened in 1838; the useful and healthful Victoria and Battersea Parks were created later in the present reign. The Houses of Parliament, the Custom-house, the front of the British Museum, the removal of Temple Bar, the construction of Trafalgar Square, the Pall Mall clubs, Regent Street, the western portion of Oxford Street, the Royal Exchange, the Post-office buildings, St. Thomas' Hospital in its new form, the new Smithfield Market, the great railway stations and the railway bridges across the Thames, with the docks of which mention has already been made,—all these and countless minor changes, have come in the nineteenth century London which now attracts visitors in numbers far beyond those of any former age from every part of the civilized world. In June, 1894, the Prince of Wales opened a new bridge of remarkable form and utility, which crosses the river at a lower point than any hitherto furnished with such an aid to the vast traffic between the Middlesex and Surrey shores. The Tower Bridge, with two massive and beautiful Gothic towers, is a compound of the bascule and suspension principles of construction. The two ends are suspended by chains at a height of 27 feet above high-water; the central portion, between the towers, is 200 feet in width, with a bascule or drawbridge which can be lifted in four or five minutes for the passage of vessels. An upper foot-bridge, between the towers, provided with both staircases and lifts, is 135 feet above high-water, leaving room for the topmasts of the largest craft. This is the largest bridge of its class in the world, and forms a novel and beautiful feature in that quarter of the port of London.

Liverpool, in 1801, contained about 85,000 people. In 1891,

THE TOWER BRIDGE ACROSS THE THAMES AT LONDON.

This bridge, which was built by the Corporation of London to accommodate the vast cross-river traffic, was opened by the Prince of Wales in June, 1894. It is constructed on the "bascule" principle in the central portion, while the two shoreward parts are upheld on the well-known "suspension" principle. The centre span, or bascule, is set between two handsome Gothic towers; and this bascule is lifted by means of counterbalancing weights placed within these towers. It is divided in the middle, and the two portions, each a hundred feet in width, are raised up flush with the Gothic towers when vessels are passing; in the illustration the bascule is down, and the bridge open for all traffic. Lifting the bascule stops the vehicular traffic for the time, but foot-passengers can ascend the towers, either by a staircase or a lift, and cross over on the upper footway. This footway is nearly 140 feet above the river at high water, so that vessels with the tallest masts can pass under safely. The bridge, from first to last, is said to have cost £830,000.



FROM A PHOTOGRAPH BY VALENTINE AND SONS, DUNDEE.

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THE TOWER BRIDGE ACROSS THE THAMES AT LONDON.

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the numbers, within the municipal boundary, still exceeded half a million, having declined, during the previous ten years, by a fortune rare indeed in British towns, by more than 30,000. The total tonnage of vessels entering and leaving the port rose from 460,000 in 1801 to over 11 millions (including Birkenhead) in 1892. It is believed that one-third of the population consists of Irish and Welsh, and in these the decrease has probably occurred. The value of exports in 1895 exceeded 90 millions sterling, while that of imports was over 95 millions. The dock-dues paid at Liverpool and Birkenhead, at the beginning of the century, somewhat exceeded £28,000; now they are much over one million. With the exception of the decrease in population, the figures now given may be applied, in proportion, to nearly every port of considerable trade in the British Isles, apart from special instances wholly belonging to the nineteenth century. Nearly all the magnificent docks have been made since 1812. During the last fifty years, the architecture of the town has been greatly improved. The fine St. George's Hall, completed in 1854, at a cost of over £300,000, is one of the grandest buildings of its class, and contains a noble organ, erected at an expense of £10,000. Numerous handsome buildings, devoted to the purposes of education, science, commerce, literature, art, and religion, adorn the streets of this magnificent city, which became an episcopal see in 1880. Birkenhead, on the Mersey facing Liverpool, is one of the most notable examples of a newly-risen town. In 1821, the straggling village had but 236 people. In 1891, the flourishing town, with 170 acres of dock-space, great ship-yards, and two fine parks, had about 100,000 inhabitants. The growth of Manchester and Salford, two contiguous towns, as of Leeds, Birmingham, and Sheffield, has been commensurate with that described for Liverpool. All are well furnished with institutions belonging to the highest development of modern culture. The population of Birmingham, the great centre of the metal-manufactures, including gun-barrels, but not cutlery, approaches half a million. Leeds is drawing near to 400,000, the craftsmen being very largely employed in the woollen-manufacture, while the iron industries, with 30,000 workmen, are now about as important, and the boot and shoe trades, locomotives, machinery, and a great variety of productions, also give work to thousands of "hands". Sheffield, with over 330,000 people, has enormous manufactures in iron, brass, and steel, besides her

peerless cutlery, and since 1871 her growth has been promoted by the making of armour-plates for ships and of steel and iron-work for railways. Salford, with over 200,000 people, is simply a smaller Manchester. The latter possesses magnificent buildings in the Gothic Town Hall, by Waterhouse, built at a cost exceeding one million; the Royal Exchange, a grand Italian structure, opened in 1874, and the beautiful Gothic Assize-courts, also designed by Waterhouse, and affording almost perfect accommodation for their purpose. Among the cotton-towns of Lancashire which have greatly increased during the century may be named Blackburn, with about 125,000 people; Oldham, with nearly 140,000; Bolton, approaching 120,000; Preston, but little inferior to Bolton; Burnley, with over 90,000; Rochdale, exceeding 70,000; Bury, with nearly 60,000; Wigan, about as large; and Warrington, exceeding 50,000. Stockport, another cotton-town, just inside Cheshire, has risen, within the century, from comparative obscurity to a population exceeding 70,000.

In the West Riding of Yorkshire, the chief seat of the woollen and mixed-stuffs manufacture, we find some remarkable instances of development during the past century. At Bradford, the first mill or factory arose in 1798: there are now above 300, including the Manningham Mills, for silk and velvet, which are among the finest in the kingdom, and cost half a million sterling to erect. The place only became a municipal borough in 1847. Since 1861, a million sterling has been expended on street improvements, and the population now exceeds 220,000. Huddersfield, becoming a municipal borough so lately as 1868, has grown from about 35,000 people in 1861 to nearly 100,000. In this, as in many other cases of rapid increase in population, notably in Nottingham, it should be observed that the extension of municipal boundaries at once annexes large numbers of people living in outlying manufacturing districts, who thus become denizens of one great town, while the separate name is either laid aside, or remains only as that of a parish in the annexing borough. Halifax, which in 1851 had but 33,000 people, is now inhabited by nearly thrice that number, and contains, in Crossley's carpet works, the largest manufactory of that class in the world, employing more than 5000 persons. There are 4 public parks, above 40 Nonconformist chapels or churches; a fine Renaissance Town-hall, by Sir Charles Barry; a costly and

richly-endowed Orphan Home and School, built by the Crossley brothers; two theatres, and a great co-operative store system on a plan already noticed. The water-works cost the Halifax corporation nearly three-quarters of a million. Applying these details to many other British towns that have grown to greatness in the Victorian age, we may arrive at some faint idea of an enormous aggregate of advance that defies imagination to fully conceive, or statistics to display in due proportions.

Lingering still in the great northern and north-western hives of industry, we find in St. Helens, Lancashire, between Liverpool and Manchester, a place which has grown, during Queen Victoria's reign, from a mere village to a town of over 70,000 people, incorporated as a municipal borough in 1868, and a parliamentary borough in 1885. It is the great seat for making crown, plate, and sheet glass, with large alkali and metal-smelting works. Still more remarkable has been the rise of Barrow-in-Furness, the iron trade of which has been already noticed. In 1847, this flourishing seaport and manufacturing town, making annually 600,000 tons of pig-iron and Bessemer steel, was a fishing-village of about 320 people. In 1864, the population exceeded 10,000; in 1895, it was approaching 60,000. The discovery of iron hæmatite ore in 1840 opened mines and smelting works; enterprise and railways did the rest. About 20,000 tons of slate are also yearly sent away from the quarries. In 1875–77 eight new board schools, for nearly 4000 children, were opened. In 1878, four new Anglican churches were consecrated on the same day, a performance probably unique in our history. In 1887, a town hall costing £80,000 was opened. The docks cover nearly 350 acres, with a water-depth of 24 feet, and on Barrow Island, opposite the town, are ship-building yards employing, at full work, 5000 men, and turning out steamships of which the largest reach nearly 9000 tons burden. Flax mills and jute works find labour for nearly 2000 women and girls, and several other flourishing trades exist, with a timber import from the Baltic and Canada, of tinned provisions from New York, and lines of steamers to Glasgow, Belfast, and the Isle of Man. A municipal borough in 1867, Barrow now, since 1885, returns a parliamentary member.

The discovery of iron-ore in the Cleveland district of north-east Yorkshire has been already described, and to this is due the won-

derful rise and progress of Middlesborough, on the southern bank of the river Tees. In 1829 a single farmhouse stood there on a marshy spot. In 1850 the iron-stone discovery was made in the neighbouring hills. In 1892 the population reached 80,000. Works for steel, iron, salt, soda, nails, wire, and tubes; ship-building yards with docks and a large export of coal, are the chief elements of industry and prosperity in this municipal and parliamentary borough with a fine graving-dock, a breakwater over two miles long, splendid municipal buildings, baths, banks, theatres, club halls, Exchange, High School, the fine Albert Park, and nearly all the appliances of British culture in these later days. The neighbouring towns of Darlington and Stockton-on-Tees, both in Durham, have also greatly grown during the same period. We have seen the rise of railway enterprise at Darlington in 1825. The chief industry still lies in the making of locomotives. The population has increased from about 6500 in 1821 to over 40,000, and in 1867 the place became a municipal borough. Stockton, in 1831, had not 8000 people: in 1895, there were over 70,000, with its suburb, South Stockton, on the Yorkshire side, connected with its parent-borough by a fine iron bridge, erected in 1887 at a cost exceeding £80,000. Shipbuilding on a large scale, foundries, engine works, blast-furnaces, potteries, corn mills, provide the chief employment, and the great improvements made in the river-bed enable large vessels to come up to the town. In North and South Staffordshire, the towns connected with pottery and with iron have had the usual development of our manufacturing towns during the last fifty years, Hanley having risen from 25,000 in 1851 to nearly 60,000; Walsall from the same point in 1851 to over 70,000 forty years later. On the Tyne, Newcastle shows a vast growth due to British enterprise, coals, iron, and steam. In 1801, the population was under 30,000; in 1895, it verged on 200,000. Rich in public buildings and institutions of every class, educational, commercial, benevolent, artistic, and scientific; with pleasure-grounds and parks in abundance, provided, like many other of her countless devices for human benefit, by wealthy, munificent, and intelligent citizens; this noble town, furnished alike with ancient and with modern sources of interest, yearly exports more than ten million tons of coal and coke; yearly receives in her river-port more than seven million tons of merchantmen; yearly launches 300,000 tons of

shipping, including some mighty men-of-war, and yearly produces, to a vast value, locomotive and marine engines, machinery, heavy cannon, chemicals and many other kinds of goods, including earthenware, glass, and wire rope. North and South Shields and Tynemouth have also greatly increased in size and importance. Sunderland is a town whose greatness belongs entirely to the nineteenth century. This fine, clean, well-built borough, with spacious streets, and pleasant neighbourhood, at the mouth of the Wear, in county Durham, owes its progress to coal and to the improvement of the port for commercial use Her public buildings are numerous and excellent, the harbour is well formed and sheltered by lengthy piers; the docks, large enough for the greatest vessels to enter, cover 50 acres; the tonnage entering and leaving the port in 1890 much exceeded 2 millions; the annual shipment of coal and coke goes beyond 4 millions of tons. The ship-building is also very important, the 13 yards on the Wear having launched in one year more than 200,000 tons of iron vessels. The population has grown from 67,000, in 1851, to double the number in 1895. In the Midlands, Derby, the head-quarters of the Midland Railway Company, there employing more than 5000 men, has manufactures of textile goods, iron, chemicals, and other products, and has grown from 32,000 in 1841 to nearly 100,000 as we write. Leicester, a very ancient borough, long ago and still great in hosiery, to which boots and shoes, iron-founding, and other trades, have lately been added, had, in 1801, but 17,000 people, since increased to about 160,000. Nottingham, another ancient town, has vastly grown in size and numbers by the incorporation of populous surrounding places. The town lies on the Trent, where the river, about 200 yards in width, is now spanned by a fine bridge of granite and iron. The Castle, on a precipitous rock, was burned in the Reform Bill riots of 1831, and, being restored in 1878, has become an excellent art museum. Few towns in England have been more changed in the century than Nottingham. The present writer testifies to the fact with a knowledge derived from early days spent in the place of his birth. The market-place, the most spacious in the kingdom, covering 5½ acres of ground, is still the chief scene of weekly traffic. The great Michaelmas "Goose Fair", most famous, amusing, thronged, and festive of those olden gatherings, is fading away to a feeble remnant of its former display. The open ground called

"The Park", with its turf and sand-pits, has long been occupied by houses of the better class. The beautiful meadows that lay between the Midland Railway, at the foot of the stately Castle Rock, and the noble river, were covered in spring with a natural flower-show of matchless beauty in the whole of England, purple crocuses in profusion growing wide and wild and free. That ground is now covered with factories and workmen's houses almost down to the river edge where Kirke White was wont to stray and to muse. The Trent Bridge cricket-ground, headquarters of one of the finest county clubs, is there in an enlarged and improved form. New public buildings, including the scientific "University College", and a well-endowed high school for boys; Renaissance municipal buildings, and two theatres, with the widening of the streets, and other changes, have made another Nottingham, symbolic of the progress of Victorian times. The trade is still mainly in hosiery and lace, with some modern make of iron, bicycles, needles, and cigars. There are three public parks and recreation grounds, covering in all over 300 acres. The population increased from about 29,000 at the beginning of the century to over 220,000 in 1897. Northampton, the English centre of the boot and shoe trade, with great breweries and much leather-dressing, has of late years grown with great rapidity. In 1801, it was a dull market town of 7000 people: it now contains over 60,000, and has a fine town hall, a museum, a free library, schools of science and art, a theatre, large hospitals, and a corn exchange.

On the east side of England, Hull, on the north bank of the fine estuary called the Humber, has so greatly grown as to return, since 1885, three members to the Commons, representing a population that has increased from 84,000 in 1851 to nearly 220,000 in 1895. There are three public parks, the usual institutions, docks and basins with an area of 200 acres, great North Sea fisheries, lines of steamers to the Baltic and North Sea ports, and to Boston (U.S.) and New York, and a large trade with Australia and India is being developed. The place now ranks third among British ports, with an average yearly value of trade, in exports and imports, reaching nearly 40 millions. Iron ships are built, including iron-clads for our own and foreign governments, and there is a large manufacture of marine apparatus, with chemical factories, tanneries, oil-mills, corn-mills, and sugar-refineries. Grimsby, on the south

bank of the Humber, has become a port of great value since 1849, with exports and imports annually worth more than 12 millions, docks covering 350 acres, the greatest fisheries in the kingdom, shipbuilding and cognate industries, and a population grown from 12,000 in 1851 to over 52,000. Ipswich, on the Orwell estuary in Suffolk, 12 miles up from the sea at Harwich, is another signal example of development in Victorian days. This flourishing place, which dates from early English times, has an older portion, with picturesque, narrow, irregular streets, and a new town possessing good public buildings of every kind. A dock of 30 acres admits vessels of 1400 tons. There are great manufactures of agricultural machines, railway material, clothing, and artificial manures, and the number of people, but 11,000 in 1801, now amounts to nearly 60,000.

In the South of England, the chief growth in the size and importance of inland towns, and commercial and naval ports, is seen at Croydon, Reading, Reigate, Richmond, Portsmouth, and Southampton. Croydon is really a marvellous instance of suburban progress, due to no new manufacture or mineral discovery, but solely to its position near London as a convenient place of residence for persons there engaged. Lying 10½ miles south of London Bridge, it was, in 1851, a dull Surrey market-town, having assizes in turns with Guildford, and containing 10,000 people. It is at present a municipal and parliamentary borough of nearly eleven times that population. The system of disposing of the sewage is the most economical and effective in the kingdom, the matter being carried to two sewage-farms covering a square mile of ground. A new and abundant supply of water, singularly pure, is obtained from an artesian-well, and the death-rate has declined from 28 per thousand annually in 1848 to under 15 per thousand in 1887. The place is remarkable for containing, with its own outlying suburbs, twelve distinct railway-stations on different branches of the London and Brighton system. Reading, the flourishing county-town of Berkshire, known throughout the world by the biscuits produced at Huntley and Palmer's large factory, and by the seeds sent forth from Sutton's nursery, has increased in population from 21,000 in 1851 to about thrice that number in 1895. Reigate, a charming Surrey town of residence for many business-men of London, has more than quadrupled her people from the 5000 of 1851. The

Surrey Richmond, with its lovely views of river, wood, and, meadows, has also vastly grown from the same cause that brought so rapid an expansion to Croydon. The noble deer-park, 8 miles in circumference, the boating and the fishing, add to the attractions of this famous place, which became a municipal borough in 1890, and has more than tripled her numbers from the 7500 of 1861. Putney, now almost a part of London, historically famous as the birthplace of Thomas Cromwell, the Tudor statesman, and of Edward Gibbon, has been greatly improved by her fine granite bridge, opened in 1886, and by a new river-wall and promenade at the line of boathouses occupied by the craft of the Leander, the London, and other notable rowing-clubs. In 1851, Putney was a sleepy Surrey village, awakening to a life of the utmost stir and bustle for the one day of the Oxford and Cambridge boat-race in the week (but one) preceding Easter, and again, at a later date, aroused to animation during the July fortnight of the Volunteer-encampment at Wimbledon now removed to Bisley, in the far west of Surrey. At the former date, the people numbered little over 5000; the present inhabitants reach nearly 25,000. Wimbledon is another striking proof of suburban progress around London. Hundreds of splendid houses, the abodes of wealthy men of business, have arisen, and the population, only 9000 in 1871, is now about thrice as numerous. The place where these words are being written, Streatham, best known from Dr. Johnson and the Thrales, has had a marvellous development in the last forty years. In 1854. there were only two churches, with one erecting. There are at the present time over thirty, besides many new Nonconformist chapels. At the former date, Streatham was a large Surrey village, with many wealthy residents in scattered mansions. The scores of such opulent "City-men" have now become many hundreds; the fields have been swallowed up by bricks and mortar; and the population has grown from about 5000 to ten times the number.

After this digression, we pass to Portsmouth, old and historical, scene of the Duke of Buckingham's assassination in 1628; of the loss of the *Royal George* in 1782; of Charles Dickens' birth in 1812. Naval development, and the needs of national defence, have caused great changes in the Victorian days. By sea and land, forts of enormous strength have been erected; the dockyard, by the expenditure of 2½ millions sterling, has been increased in area from

116 acres to nearly 300; twelve large docks afford ample room for the repair of men-of-war; a grand town-hall was opened in 1890; and the population has increased from about 70,000 in 1821 to nearly 170,000 in 1895. The greatness of Southampton, whence Henry the Fifth, be it remembered, sailed in 1415 to beat the French at Agincourt, belongs to the age of steam-communication. Placed at the head of the grand estuary called Southampton Water, with the entrance shielded by the lofty and lovely Isle of Wight, the port has become one of departure and arrival for great mail-steamers to the West Indies, Brazil, South Africa, and, very lately, to New York. The docks were first opened in 1842, and these have been greatly extended and improved. In 1890, a new tidal dock, covering 18 acres, and with a depth of 26 feet of water at lowest tides, was opened by the Queen. The gross burden of the shipping using the port exceeds 2 millions of tons; the population has grown from about 8000 in 1801 to nearly 70,000 in these latest days.

We may here note the rise of some towns entirely created by great railway-companies as places of manufacture for their vast rolling-stock of locomotives, carriages, or "coaches", in railway-language, and wagons for goods. Crewe, in the south of Cheshire, could show, in 1840, about three houses as her right to possess a name at all, apart from Crewe Hall, the seat of the peer to whom she gives a title. In 1843, the London and North-Western Railway directors chose the spot for erecting railway-works. In 1851, the population had become 4500; in 1877, the place was a municipal borough; in 1895, the population was about 30,000, for whom the directors of the vast railway-system which gave birth to the town have provided many excellent public buildings, a good sanitary system, and a beautiful park of 40 acres. New Swindon, in the North of Wiltshire, is another Crewe, created by the resources of the Great Western Railway Company, who have erected a town well furnished with needful structures for the intellectual, moral, and religious improvement of their 9000 workmen and the families of the married men. In 1861, the place had under 7000 people, after starting, in 1841, with none at all; in 1895, about 30,000 people were gathered in this hive of industry.

From Swindon, already on our route for the west, we pass, more swiftly even than by the Company's famous "Flying Dutch-

man" express, to Bristol, a city of olden fame. The place has been already noticed in connection with the disgraceful Reform riots and the beginnings of steam-traffic over the Atlantic Ocean. A great trade is carried on with the Irish ports in cattle and other food-productions, and there are large manufactures of glass, leather, soap, pottery, sugar, and chemicals, with ship-building and machinery yards. In 1809 a great development of harbour-room in the Avon was effected by the deepening of the river-bed, and in 1879 extensive docks were created lower down at Avonmouth and Portishead. The tonnage of vessels using the port has grown from over half a million in 1847 to nearly thrice the amount, and the population, 61,000 at the beginning of the century, was nearly quadrupled in 1895. Taking steamer from Bristol to the coast of South Wales, we shall find some of the most striking instances of our modern mining and commercial progress. Cardiff, in county Glamorgan, on the Taff, is a pure production of coal, iron, and the Marquis of Bute. The port sends out steam-coal, in unequalled amount, to every part of the world that needs such an article. 12,000 tons per hour can be placed on shipboard by the special apparatus erected on the quays, and the whole annual export of the mineral far exceeds 10 millions of tons. In 1839, the first dock was opened, when the yearly coal-export was about 4500 tons. The Bute docks, covering 110 acres, cost about 4 millions of pounds. In 1888, the Barry Dock, of 88 acres, was completed. Lines of steamers ply to New York, and to London, Liverpool, Glasgow, Bristol, and other home-ports. Above a million has been expended in street improvements and in new water-works, bringing an abundant supply from the hills called Brecknock Beacons, 30 miles to the north. There are the usual public buildings and park, three daily papers, and a new university college for South Wales. The population statistics are startling. In 1801, the little town, known only by the castle where Robert Duke of Normandy died a captive, contained 2000 people. In 1841, there were 10,000; in 1871, nearly 60,000; in 1895, over 140,000. Swansea, well placed on its bay of safe and ample anchorage, has greatly risen since the opening of the 60-acre docks in 1850. An enormous manufacture of tin-plates, worth annually more than 5 millions, a good coal-export, and a large import of metals for smelting, are the chief agencies in the prosperity of this bustling, smoky town, whose

population had risen from 31,000 in 1851 to about 94,000 in 1895. The vast development of South Wales, through her coal and iron in the soil of Glamorganshire, is well illustrated in a township of the Rhondda valley, bearing the fearful name of Ystradyfodwg. It is a district of large collier-villages, and the population had risen from a few hundreds at the beginning of the century to over 90,000 in the seventh decade of Victoria's reign. Merthyr-Tydfil, on the Taff, northwards from Cardiff, in the centre of the Glamorgan coalfield, and producing vast quantities of iron and steel, has risen from about 8000 people in 1801 to over 60,000 in 1895. Newport, in Monmouthshire, just above the mouth of the Usk, has vastly grown through becoming an outlet of steel, iron, and coal, and an importing harbour for iron and other ores, with modern manufactures of railway and telegraphic apparatus, brass, pottery, india-rubber, and gutta-percha. The total value of the commerce in 1889 approached 3 millions; the docks cover 80 acres; the population, less than 1100 at the beginning of the century, now exceeds 50,000.

In South Devon, Plymouth has been already noticed for her fine breakwater. This strongly fortified place, magnificently situated on her famous Sound, and rich in historical reminiscences coming home to the hearts of all patriotic Britons, has been greatly improved through the public spirit of her citizens in recent years. In 1874, a splendid Gothic Guildhall became conspicuous among many fine buildings in wide streets of modern erection. There are a considerable foreign, and a very large coasting commerce, and the population, which was 43,000 in 1801, has more than doubled during the century. Plymouth, and the adjoining Stonehouse and Devonport, have often been styled the 'Three Towns'. The last place, until 1824, was only known as Plymouth Dock. It is now a municipal and parliamentary borough, and a naval arsenal and dockyard of the first class, with government establishments extending 4 miles along the estuary of the river Tamar, called "Hamoaze" (or "dwelling by the water"). There are naval and military barracks, a military hospital, an engineers' college, powder-works, magazines, and a considerable coasting-trade. The population, 34,000 in 1841, now approaches 60,000.

Chatham, on the upper estuary of the Medway, has also greatly grown in connection with the royal navy. Strongly fortified by

land and water, this great naval arsenal, fortress, and dockyard has huge barracks for all arms of the service, magazines, storehouses, hospitals, and other establishments. The shipyard extends for about two miles, with dock-space for the largest vessels, and narrow-gauge railways in every needful direction. In 1883, after the toil of seventeen years, largely due to convicts, three great wet-docks were opened, with an area of nearly 70 acres, on 400 acres of land reclaimed from marsh at a total cost of 3 millions. About 5000 labourers and artisans are employed by the government, and the population, 28,000 in 1851, now exceeds 50,000.

Before proceeding to notice another class of English towns, we must refer to the important legislation which opened the way to a proper system of local government, without which the progress lately described could not possibly have been achieved. Prior to 1835, nothing could be more scandalous and corrupt than the administration of affairs in more than 200 municipal boroughs of England and Wales. Robbery and jobbery are weak words to describe the wrongs perpetrated by self-elected corporations upon their hapless fellow-citizens. The funds of the corporation were diverted from public uses to periodical guzzling of aldermen and councillors; to bribery and "treating" at parliamentary elections, and to other evil and degrading ends. The inhabitants of towns had, in fact, been deprived of self-government since the end of the fourteenth century, and it was high time that a system should cease under which, in addition to other mischiefs, charity-funds for which the corporation were trustees were sometimes stolen by these literally "chartered" rogues. The Municipal Corporations Act swept away, in most of the cities and towns, with the notable, still-existing exception of the City of London, all this festering iniquity of long growth, and committed the administration of local affairs—the gas, the police, the paving, the cleansing, the supply of water, and other matters closely concerning the public welfare—to councils elected by the ratepayers who contribute the funds for these essential needs of social life. A new sense of citizenship arose. With freedom, most beneficent of secular boons, came energy, enterprise, a just pride in local well-being, a resolve to go forward to a better condition of affairs. Under local Acts, power to borrow moneys on security of the rates has been very largely used for the construction of public works which, in most cases, have amply

repaid and justified the outlay. Special committees of the council, in large boroughs, administer the provisions of the sanitary and other Acts which have been mentioned, and the local institutions of every kind, save the prisons, are now under the control of those who have, at any rate, the best means of knowing local needs, and who, elected by their fellow-citizens, and jealously watched by rivals, and freely criticised by a local press, must act under a constant and acute sense of responsibility to those who can speedily cause their ejectment from office.

Turning now to what Mr. Escott, in his admirable *England: its People, Polity, and Pursuits*, has styled the "pleasure-towns" of the land, we pass over Bath, Harrogate, and Buxton as products of the last century which have undergone little change. Not so with the resorts of fashion, of spinsterhood, of retired members of both services, and of feeble health, now to be named. Cheltenham, lying in a fair plain near the Cotswold Hills, became a place of resort for its saline and chalybeate springs, which in 1788 gave much benefit to George the Third. In 1801, however, the place had but 3000 people, since increased to over 50,000. There are beautiful public gardens, a fine "promenade", pump-rooms, squares, and crescents, the older architecture of which presents an unsurpassed lack of taste and form. Many Anglo-Indians reside there, and winter brings a large contingent of fox-hunters. The climate is healthy but not bracing; the great educational institutions will be noticed hereafter. In 1876, the town received a municipal charter. Beautiful Clifton, with its breezy Downs, giving glimpses of the Severn Sea, is a handsome suburb of Bristol, with stately houses inhabited by the more opulent merchants of the city, and has been mainly developed in the later half of the century. Leamington, 2 miles north-east of Warwick, is a place of wholly modern growth. Saline, chalybeate, and sulphureous springs were discovered in 1784, but the buildings of any note came long after that date. The Queen, as Princess Victoria, was there in 1830, and the little town was afterwards named the "Royal Leamington Spa". In 1811, there were but 540 people; the present population exceeds 25,000. A good hunting-country is here also, in its season, an attraction to many sportsmen. It became a municipal borough in 1875. Tunbridge Wells, on the borders of Kent and Sussex, in a beautiful and very healthy country, was visited in the Stuart

and early Georgian days by Londoners of fashion seeking to repair, in a pure and bracing air, or by draughts of chalybeate water, the ravages due to the dissipations of "town". The place has of late years had new public buildings, and became a municipal borough in 1889. Since 1851, the population has been nearly tripled, and now reaches near to 30,000.

The hydropathic system, or method of water-cure, invented in Germany early in the nineteenth century, caused the rise of many establishments in England, some of which became the nucleus of new towns. The fashionable, very healthy, and beautiful Great Malvern, on the east side of the noble range of hills, rising up to over 1400 feet in the Worcestershire and Herefordshire "Beacons", had in 1801 but 800 people; it now contains at least 10,000 inhabitants. The Yorkshire Ilkley, among heathery hills north-west of Leeds and Bradford, had a like origin about 1848, and now contains about 6000 people. We resort next to the seaboard, where on every attractive part of the English and Welsh coasts either new towns have arisen, each with its pier and promenade, its "season", its nigger-minstrels, its teasing itinerant photographers, its bathing-machines and band, its sand or shingle, or walks along the cliff, and its troops of holiday-trippers; or, with the growth of population, old sea-bathing places have been greatly developed. Here, the pride of place must be given, beyond doubt, to Brighton. A mere fishing-village from early Plantagenet days to the later years of the eighteenth century, it came into fashion after the visit of the Prince of Wales in 1782. As prince, as regent, and as king, he yearly sought the benefit of its fine bracing air, and between 1827 and the opening years of Victoria's reign, the great sea-wall at the east end was erected. The railway opened in 1841 caused a steady and rapid increase. In 1854, the town became a municipal borough, and its magnificent sea-front, unrivalled in the world, with its fine West Pier, and its superb hotels, stretches for nearly five miles from Kemptown westwards. The whole of this broad well-lighted promenade is laid in asphalt, and, during the main season, when 40,000 visitors swell the usual numbers, the scene is one of the most animated of the kind in the world. A boundless supply of water, from the neighbouring chalk, cost nearly half a million, and the sewage is now conveyed four miles away to the sea on the east. In 1801, this queen of marine-resorts had

about 7000 people; its present residential inhabitants exceed 120,000. We have space for only a few of the more remarkable instances of modern rise or increase on our southern, western, and eastern coasts.

At the beginning of the nineteenth century, historical Hastings was but a little fishing-town with two streets. Now, with St. Leonards, an extension on the west, this favourite resort, with a population rapidly approaching 60,000, has one of the finest sea-side esplanades in the kingdom, three miles in length, sheltered from the east and north by high ground inland. Good drainage, an excellent supply of water, including sea-water for indoor baths; a mild, healthy, and very equable climate; a large public park, the "Alexandra", and three public gardens; two noble piers, stretching 300 yards out to sea, with extensive pavilions at the end for shelter, are the chief attractions of this modern and beautiful development of the old Cinque port. On the east side of the noble Beachy Head, the loftiest cliff on our southern coast, towering up with its nearly 600 feet of milk-white chalk, lies Eastbourne, still more modern than Hastings in its rise as a pleasure-town. The mediæval place so named had become a mere fishing-hamlet when, in the latter half of Victoria's reign, the wealthy and enterprising chief landowner of the district, the Duke of Devonshire, began to construct the handsome town, with broad, tree-lined streets, a two-mile parade, a triple tier of terraces, clubs, golf-links, theatre, and all the usual appliances of such resorts. In 1821, the population was but 2000; in 1861, it was under 6000; in 1883, Eastbourne became a municipal borough, at present containing nearly 40,000 inhabitants. A more striking progress even than that of Eastbourne has been the advance achieved by Bournemouth, on the Hampshire coast. The Sussex watering-place possessed the nucleus of a town at the opening of the Victorian period, and was fairly near to London. In 1838, Bournemouth had nothing but a coastguard-station and a few fishermen's cottages. The climate, with a soft but not enervating air; the three miles of sands, the pine-woods, and the attractive position on the coast, near the Isle of Wight, Poole Harbour, Weymouth Bay, and other scenes for steam-boat trips; have combined in effecting the advance of Bournemouth from 2000 people in 1861 to above 40,000 in 1895. The place has two long piers, several special hospitals, an aquarium, a winter-garden, and other institu-

tions, and is now reached in about 2½ hours from London by the South-Western Railway's Pullman-Car Express. No notice of the seaside towns of our southern coast can be complete without some description of Torquay, on the splendid historical Tor Bay, at the middle of the southern coast of Devon. In 1801, the place had a few fishermen's huts. During the war, some retired naval officers and their families began to reside there, on the shore of the noble haven where our squadrons often lay for shelter from south-westerly gales. The mildness of the air attracted consumptive patients, and Torquay, by degrees, became known all over Europe, and some members of the imperial family of Russia resorted to the spot, amongst foreigners from many other countries. Nothing can be more beautiful than the varied rock-scenery, the inland country, the rich greenery of turf and trees, with wild plants and creeping ivy growing on the red sandstone down to the very edge of the briny water. Terraces, gardens, scattered villas, and magnificent hotels make a charming prospect for the gazer from the sea, and, in the summer days, the waters are enlivened by the presence of many of the finest yachts that flit about our coasts under sail or steam.

On the north coast of Wales, during the last forty years, Rhyl, Llandudno, and other pleasant places have sprung up by the sea. On the Lancashire coast, Blackpool, with excellent sands, a bracing climate, a bold sea, and beautiful views, has risen from less than 2000 people in 1851 to become, within the last twenty years, a municipal borough containing 25,000 inhabitants, with two large piers, a 3-mile promenade, an aquarium, winter-gardens, theatres, and crowds of visitors during the summer-season. To the south, on the further side of the great Ribble estuary, Southport presents us with one of the most remarkable developments, in this class of towns, on the whole of the English coast. At the close of the eighteenth century, on a dreary expanse of sand, one or two houses, including an inn constructed from the timbers of a wreck, were all that met a chance visitor's eye. In 1830, a sea-side village began to rise and, slowly at first, to swell into a town which, in the latter half of the Victorian age, has become a municipal borough of 50,000 people, with a 3-mile esplanade; a magnificent establishment called the Winter Gardens, containing a concert-hall, an aquarium, and a theatre; an opera-house, splendid baths, a public library and art-gallery, schools of science and art, a grand market-

hall, a park of 30 acres, a marine park and sea-water lake, and other institutions devoted to purposes of health and pleasure. A pier nearly seven-eighths of a mile in length conducts visitors, by a steam-tramway, out towards the edge of the far-retiring waters when the tide is down.

When we pass over to the eastern coast of England, we find, between the North Foreland and Flamborough Head, some fifty towns of the class under review, many of which began to exist in railway-times. Lowestoft, in Suffolk, near the Ness which it names, the most easterly point of the whole British coast, is a town with a history from Plantagenet days, but in 1801 the population was only 2500, since grown to 25,000 persons, with a grand new pier and pavilion, an esplanade, and the usual attractions for summer-visitors. Great Yarmouth has long been famous for other matters than its spacious sands, which yearly attract many thousands of pleasure-loving people. On the north coast of Norfolk, Cromer and Hunstanton are quite modern creations. Even the low-lying Lincolnshire coast has of late years started Skegness in the centre, and Cleethorpes in the north, for holiday-trippers. In Yorkshire, Bridlington or Burlington, of some note in the Civil War, has much increased in favour, and Filey, to the north of Flamborough Head, brings us to magnificent Scarborough, proudly styled, not only by the Yorkshire people, the "Queen of Watering-places". This old place, with memories of Danish and Norman days, and of the Stuart contest, has been vastly improved since 1851, when its population amounted to 13,000. The noble sea-front, with its green-clad cliffs and wooded ground, and its gardened valley, crossed by the high Cliff Valley Bridge, is divided into two towns by the lofty projecting Castle Cliff. On the north sands, a new promenade, four-fifths of a mile in length, and constructed at a cost of £50,000, was opened in 1890. On the south side are the vast Grand Hotel; the beautiful grounds of the Spa, with saline and chalybeate springs; a very fine aquarium, and a lift-apparatus from the sands to the summit of the cliff. The inhabitants, apart from the countless summer-visitors, now exceed 35,000. Whitby, with its abbey-crowned cliff and memories of St. Hilda, its fine inland scenery of the Yorkshire woods and moors, and its manufacture of jet obtained from the neighbouring cliffs, has been growing in favour of recent years, and has now, by a direct line, direct com-

munication with Scarborough to the south, and with Saltburn and Redcar to the north.

It is now high time to cross the Cheviots or the Tweed, and see what the nineteenth century has done for the towns of the northern kingdom, with a population that has doubled since 1801, with three-quarters of a million to spare. On Edinburgh, the grandly historical, the nobly placed, the romantically beautiful and picturesque, the assuredly unsurpassed, throughout the British empire, in her sum-total of claims to interest and renown, there is little need to dwell at length. Her modern educational institutions will be elsewhere noticed. The restoration of St. Giles' Church, completed in 1883; of the earliest portion of the Castle, finished in 1889; St. Mary's Episcopal Cathedral, opened in 1879; the beautiful Scott Monument, the new Medical Schools, the completion of the University buildings, and the new Museum of Science and Art, are among the modern architectural improvements. The quaint Old Town has, to a large extent, disappeared; the chasms have been spanned by substantial bridges; the New Town, with its handsome streets and squares, and far-spreading suburban villas, has arisen; the Princes Street Gardens cover the site of the old drained Nor' Loch, at the foot of the Castle ridge. The Queen's Park and Arthur's Seat, once the royal hunting-ground of Holyrood Palace, have become public property for recreation. The chief industries of the Scottish capital, by a combination painful, perchance, to the votaries of the Muses, lie in the production of books and beer. Vastly more than half the ale produced in Scotland, and, apart from a notable exception in Glasgow, to which it is needless here to refer, a very large proportion of the books, come forth from Edinburgh to quench physical and intellectual thirst. The population of the city had grown from 136,000 in 1831 to about 270,000 in 1895. With Edinburgh is now connected by continuous houses the port of Leith, vastly enlarged during the last seventy years. The harbour, at the cost of a million sterling, includes two piers, each exceeding half a mile in length, seven graving-docks, and five docks, with a total area of 43 acres. There are lines of steamers to London, northern Scottish and Baltic ports, and New York, with a trade so great and varied, by steamers and sailing-ships, as to reach an annual value of 8 millions in foreign produce, with exports of 3 millions in coal, iron, and manufactured goods.

In 1841, the population was 26,000; in 1895, it had more than tripled. The industries include ship-building, sugar-works, breweries, engineering, saw-mills, rope-works, chemical factories, distilleries, and flour-mills. Glasgow, the second city in the British Isles for population, has been already treated at some length in connection with the rise of steam-navigation. The numbers have risen from 77,000 in 1801 to nearly 800,000 in the city and suburbs, or about 660,000 in the parts now incorporated as the municipal town. The quay-length of the harbour and docks, downwards from the Broomielaw, exceeds 11,000 yards, and there are two graving-docks admitting vessels of the largest size. The yearly value of imports and exports exceeds 25 millions sterling, nearly equally divided between the two, and the customs-revenue annually exceeds a million. The industries are on a very varied and extensive scale, in cotton, woollen, linen, silk, jute, iron, steel, all kinds of machinery and engineering, bleaching, chemicals, pottery, glass, bricks, brewing, distilling, tanning, tobacco-cutting, sugar-refining, calico-printing, dyeing, book-printing and engraving, with the enormous ship-building already described. The Corporation, on its popular basis, has done wonders for the improvement of the city. The great water-works have been already described, now capable of bringing 110 millions of gallons per day. Since 1866, more than two millions have been spent on architectural improvement. Underground railways now connect every quarter of the huge commercial metropolis of Scotland with the North British and Caledonian systems. The Clyde is crossed by ten bridges, including two railway-viaducts and two foot-bridges on suspension-chains. Eight parks, the Botanic Gardens, and the Galleries of Art, with some large public libraries, provide recreation for body and mind. Among the more modern public structures, the Municipal Buildings, centrally placed in George Square, and erected at a cost exceeding half a million, are of fine exterior, in the Renaissance style, with central steepled tower and four cupolas at the corners. The interior, for magnificence devoid of all gaudiness and glare, for sumptuous beauty and exquisite taste, is probably unsurpassed in the world. The entrance-hall, with tesselated floors, and staircases in fine marble, displays thirty-four round pillars, of Aberdeen granite, worked each at a cost of £100, and thirty-two grand square columns, with capitals of dark green marble. The rooms throughout are adorned with marble

and with ornamental woods, employed with the finest effect, and the impression left on the spectator's mind is one of permanent and pleasant remembrance, in which the hall-dome, of beautiful Venetian mosaic, admirably copied from the famous San Marco, is one of the most prominent features. The new University Buildings, designed by Sir Gilbert Scott, are above the West End Park, and were completed in 1870, at a cost of nearly half a million. They form an oblong rectangular pile, 200 yards long by 100 broad, in Collegiate fourteenth century Gothic, with two quadrangles, each 60 yards square, and a tower of nearly 300 feet in height.

Dundee, already named in connection with the jute manufacture, is the third town of Scotland for population, and has made a great advance in the last half-century, from about 64,000 people in 1841 to nearly 160,000. The annual value of manufactures in hemp, flax, and jute reaches nearly six millions. The delicious marmalade is known in every quarter of the world. The whale and seal fishing carried on by ships belonging to the port exceeds that of any other place in Great Britain. The splendid docks, including two for repairs, have cost about three-quarters of a million. The railway-bridge across the Tay is over 2 miles long, carried on 85 piers, at a height of 77 feet above high-water mark. Aberdeen is another Scottish town of high rank, which has greatly grown in the nineteenth century. The population, which was 27,000 in 1801, is now about 130,000. There are many good modern public buildings, and a park of 43 acres was opened in 1883. The trade of the port has much grown since 1850, and the annual shipping that enters it exceeds 600,000 tons. In the century, more than a million sterling has been spent on harbour works, including a breakwater, a graving dock, the Victoria Dock, and a needful diversion of the river Dee. The "Paisley shawls" are now things of the past, but this busy Renfrewshire town, with its enormous manufacture of cotton thread, its dyeing, bleaching, chemicals, and starch; its tartans, carpets, distilleries, and brewing; its preserves and corn-flour, with some ship-building on the river Cart, lately deepened to 18 feet, had grown from 24,000 in 1801 to about 70,000 in 1895. There are some fine public buildings, and three parks, with a total area of nearly 70 acres. The Coats Memorial Baptist Chapel, completed in 1894, at the cost of £100,000, is held to be the finest ecclesiastical structure erected in Scotland since John Knox played

his part in changing the religion of her people. Greenock, the finely-placed Renfrewshire port, ranking seventh in size among Scottish towns, is another place of great recent progress. The modern public buildings are fine, including a good Renaissance town hall and municipal buildings, opened in 1886. There are three public parks, good water-works, finished in 1883, and spacious docks for the 1½ million tons of shipping that uses the port. Ship-building in steel and iron is extensive, with manufacture of marine requisites, and a great business in sugar-refining. This birthplace of James Watt has grown from 17,000 people in 1801 to over 60,000 at the time of our record. The beautiful west end of the town has spacious tree-lined streets, and an esplanade 1½ mile in length. Perth, the fair city of historic renown, now marked by its vast railway station at the entrance to the Highlands, finds its chief modern account in dyeing. There are two beautiful public parks, 170 acres in all, on the west bank of the Tay. The population, in 1831, was under 20,000, and now has reached over 30,000.

Among the "pleasure-towns" of Scotland, some of the chief modern examples are found on the beautiful Firth of Clyde—Kirn and Dunoon, Wemyss Bay and Innellan, and lovely Rothesay, on the Isle of Bute. This centre of Clyde yachting, with its perfect anchorage, mild climate, and admirable service of steamers to all points, has now a population of 10,000, with a harbour completed in 1884, and many commodious public buildings. In the western Highlands, the modern tourist has created or greatly increased such places as Tobermory, the capital of Mull, and Oban, in Argyllshire, with her 40 hotels or so, on the curving shore of the beautiful land-locked bay, studded in summer with steamers and yachts. With the present century, Oban began to exist as a fishing-place. In 1821, there were 1359 people: in 1895, the resident population was 5000, with double the number of visitors in summer, making trips to Staffa and Iona, and the Pass of Glencoe, and to Lochs Etive and Awe, and Ben Cruachan of the nine peaks, and passing on to Inverness by Loch Linnhe and the Caledonian Canal. This capital of the northern Highlands has been much improved of recent years by the erection of a fine Episcopal Cathedral, handsome hotels and extensive barracks, a good suspension bridge, and, alike for the inhabitants and the many summer visitors, by the laying out, as a public garden, of the lovely wooded islands in the

river, connected by tiny bridges crossing a maze of narrow streams, all of them portions of the Ness, with cascades and rapids on every side, making a series of exquisite little scenes, full of charm and surprise, bewildering in beauty, and impossible to describe in the mingling of verdure and light and shade, and the music of waters in their running and their fall.

The population of Ireland, which amounted, in 1801, to nearly 5½ millions, and had risen, in 1841, to nearly 8¼ millions, has since steadily decreased, from causes already noticed, to about 4½ millions. There are few towns, therefore, in which any increase of population and prosperity can be recorded. The capital, Dublin, had 168,000 people, in 1804, and nearly 280,000 in 1891. The city has received many improvements, some of which are due to the munificence of the Guinness family. By their expenditure St. Stephen's Green has become a beautiful People's Park of nearly 20 acres. A National Art Gallery, a Natural History Museum, a National Library, and a Science and Art Museum have been recently erected; the Spencer Dock was opened in 1873, and the harbour has been improved by the construction of the two great breakwaters known as the South and North "Walls". The chief industries are the very large making of porter and stout by the Guinness Company, the distilling of whisky, and the weaving of poplin from worsted and silk. The restoration of St. Patrick's Cathedral, in 1865, by Sir Benjamin Guinness, has already been mentioned; Christ Church Cathedral was restored, in 1878, by Mr. Henry Roe. Picturesque Cork, the great town of south Ireland, famous for its fine harbour, for Father Mathew, and for butter yearly exported to the value of 3 millions, had declined in population from nearly 80,000 in 1871 to 75,000 twenty years later. The Cove of Cork, formed by the estuary of the "pleasant waters of the river Lee", has become, since the rise of trans-Atlantic steam-navigation, a harbour of great importance, where the steamships of seven different lines between Liverpool and New York call in to receive and to land passengers and mails. The place is defended by powerful forts on the mainland and on Spike Island. Haulbowline, another island, has large naval storehouses, and a great dock for the repair of men-of-war.

Belfast, the great manufacturing and commercial city of Ireland, mainly in county Antrim, but with growing suburbs stretching into

county Down, is the one instance of important growth in large Irish towns during the nineteenth century. Vastly improved by the fresh construction or enlargement of bridges and streets, including the fine thoroughfare called Royal Avenue, and by the opening of several public parks, this Irish Glasgow, on her beautiful and spacious lough, with villa-studded shores, had grown from 37,000 people in 1821 to about 260,000 in 1895. The harbour has been and is being greatly extended and improved, at a cost of 1½ million pounds. The tonnage of the vessels using the port is nearly 2 millions, and the annual Customs-revenue amounts to about 1¾ millions. Very large sums have been spent on drainage to carry noxious matters far away for discharge into the sea. The linen manufacture and whisky-distilling, long chief industries, have since 1860 received a very important addition in ship-building, turning out some of the finest Atlantic liners afloat, of which the *Majestic* and *Teutonic* are recent examples. In 1888, Belfast was raised to the status of a city, a distinction well earned by the energy of her people as displayed in what has been here set down. Londonderry, on the river Foyle, three miles above its entrance into the lough so-named, has some good modern buildings, and, with factories of linen, iron-foundries, and some ship-building, has grown from nearly 20,000 people in 1851 to about 36,000 in 1895. There are two cases, in Ireland, of towns whose rise belongs wholly to the nineteenth century. It was in 1817 that at a fishing-village called Dunleary, about 7 miles south-east of the centre of Dublin, some new harbour works were begun. Four years later, on the landing of George the Fourth, the little place was styled Kingstown, and it became a residential suburb for wealthy traders of the capital. In 1859, the splendid harbour was finished at a cost of over £800,000, with an east pier three-fifths of a mile, and a west pier nearly a mile in length, the two inclosing over 250 acres, with water from 13 to 27 feet in depth. There are mail steamers twice daily to Holyhead, in Anglesea, and the population now approaches 30,000. On the borders of Dublin and Wicklow counties, a watering-place called Bray, formerly a little village of fishermen, has become a town of about 7000 people, with a mile-long esplanade, well-built houses, hotels, and other elements of such popular resorts.

CHAPTER XVIII.

AGRICULTURE, HORTICULTURE.

Recent decline in agriculture—Royal Agricultural Society of England—New manures and machinery—Improvement of farm-stock—Ensilage—Statistics of agriculture—Horticulture—Increasing demand for flowers—Landscape-gardening—Growth of fruit for preserves.

A chapter on "progress in agriculture" in Great Britain might, in most respects, and for most localities, as regards this last decade of the nineteenth century, be treated like the famous chapter on the snakes of Iceland. After rapid progress has come serious decline, due partly to the action of the Free Trade system; partly to climatic causes; in some measure to the lack of wisdom, energy, and enterprise in cultivators of the soil; and, in a degree, to the want of legislation for the replacing on the land, either as small owners, or as petty tenants with security for their expenditure of labour and consequent improvements, of the peasantry who have, of late years, so largely migrated, in England, from the country to the town, and contributed to the swelling of the urban population. The Royal Agricultural Society of England was founded in 1838 and rapid progress was made in scientific husbandry, in the use of new manures, such as Peruvian and artificial guanos, bone-dust, nitrate of soda, and other aids to fertility in certain soils. Machinery for ploughing, reaping, mowing, threshing and winnowing, brought economy of labour, and, as the Smithfield Club shows have proved, farm-stock was by degrees brought to a pitch of excellence not dreamed of in earlier days. The decline of prosperity began soon after 1873, and since 1878, with rare exceptions, the soil has been losing fertility with the lessening of farming-capital, and prices both of corn and of meat have much given way under the unprecedented influx of foreign produce. No legislation has hitherto served the purpose of the farmer, who can now scarcely make tillage pay at any rent, however low. Something has been done in providing the agricultural labourers with allotments, but the whole subject of tillage is now in a transitional state with which it would be profitless to attempt here to deal. The most recent improvement in farming industry is that known as ensilage, a word coming, through the French language, from a Spanish word mean-

ing "to store in a *silo* or pit". In 1882, the system was being largely applied, in the British Isles, to the storing of green fodder, such as meadow-grass, rye-grass, lucerne, clover, vetches, and sainfoin, under pressure either in silos or in stacks, with varieties of "sweet" or "sour" silage, as the stuff so treated is called, according to the methods employed in storing. The farm-stock eat the fodder with relish, and the system is advantageous, in our climate, as making the agriculturist independent of weather in saving his fodder-crops. A few figures will illustrate the recent changes in British agricultural and pastoral matters. Between 1865 and 1885, the area under wheat decreased from 3½ millions to less than 2½ millions of acres, or by nearly one-third, and the annual value of the crop from 33½ millions to under 16 millions. Barley, on an area of 2¼ million acres, fell 20 per cent in price, and oats had nearly an equal decline in value. During the same period, forage-crops increased by 12 per cent and permanent pasture by nearly one-fourth.

Much advance has been made in horticulture, and, along with the vast importation of foreign produce to satisfy the taste for floral decoration which has become a kind of mania at the opposite social poles of the dinner-table and the ball-room on one hand, and of funeral-rites on the other, British florists have done much in improving many specimens, including the carnation, the pink, the auricula, the pansy, the phlox, the dahlia, the pelargonium, and the rose. Kew Gardens, the Crystal Palace, and the London parks have fine displays of horticultural production, and the countless flower shows held throughout the land are proofs of the growth in public taste for one of the most beautiful gifts of nature, indefinitely changed and improved by art. Landscape-gardening, practised in this country with great success, in the eighteenth century, by William Kent and Lancelot Brown, has been largely developed in the modern public parks, arboretums, and recreation-grounds already mentioned. One of the finest modern gardeners in this style was Sir Joseph Paxton, the creator of the Duke of Devonshire's magnificent display at Chatsworth, in Derbyshire, where the same ingenious man designed the grand conservatory, covering an acre of ground, 300 feet in length, 145 in width, and 65 in height, and showed the way to his far greater work in Hyde Park and at Sydenham. Of late years, some attempts have been made, with

fair success, to grow fruit on a large scale for the making of preserves, and in Kent, Worcestershire and other fruit-counties, "jam-factories" have arisen which supply consumers with a large amount of pure and wholesome substitutes for butter.

CHAPTER XIX.

EDUCATION.

Arnold and Rugby School—Advantages of competitive examinations—The great public schools of England—Middle-class and grammar schools—Public examinations instituted—Training of teachers—Popularizing of Oxford and Cambridge Universities—Founding of new colleges—Colleges and high-schools for women and girls—Advance of art-instruction—The South Kensington Museum—Technical education. Elementary education in earlier part of century—Beginning of state-education—Establishment of school-boards—Compulsory and free education—Improvement and cheapening of school-books. Popular education in Scotland—Institutions for higher education—The universities. Progress of education in Ireland—Extension of middle-class schools. Proofs of the benefits of state-education—The prison making way for the board-school.

In no department of social advance has a more thorough and revolutionary change been effected than in this essential of civilization. The wide meaning of the word includes much that is treated under other heads, and in this chapter we deal chiefly with what concerns the training of the younger portion of our population in schools of every class and at the universities of the United Kingdom. The upper-class and middle-class schools are the first to engage our notice. The appointment of Arnold in 1828 to the head-mastership of Rugby was an epoch in the history of the great public schools of England. There is no need to dwell upon the character and school-discipline of a man so well revealed to all in the pages of his pupil Dean Stanley's *Life of Arnold*, and in Mr. Hughes' *Tom Brown's Schooldays*. During his fourteen years' tenure of his Rugby post, until his sudden and lamented death in June, 1842, he laboured with eminent success to make the little community which he ruled "a school of Christian gentlemen". He was both loved and feared by his pupils, and a high moral and religious tone was created. His example was followed, in the headship of other schools, by many of those whom he trained at Rugby. It was Arnold who fully recognized and brought to

perfection the monitorial or prefectual system, by which the senior boys, themselves "under authority", are utilized for the government of those in the lower forms. A sense of responsibility is thus created in the elder lads, who are also trained, by the exercise of rule, for the business of life. In the Victorian age, a great improvement in school-work has come through the rise and vast development of competitive examinations for scholarships, Civil Service clerkships, and the army, which have forced upon instructors too exclusively devoted to Latin and Greek a due recognition of mathematics, natural sciences, modern languages and literature, geography and history, a remark which applies to public and private schools of every class. In 1862, a Royal Commission began to inquire into the condition of the nine chief public schools —Eton, Winchester, Westminster, Charterhouse, St. Paul's, Merchant Taylors', Harrow, Rugby, and Shrewsbury. Then the Public School Acts appointed new governing bodies, on which the interests of masters, pupils, and parents, the universities, and the learned societies, are all represented. These new managers have power to control the degrees of age and knowledge for entrance to the school; to award scholarships and "exhibitions" to the universities as the result of competitive examinations; to provide for exemption from sectarian religious instruction; and to abolish the clerical qualification hitherto deemed essential in head-masters.

Outside these leading and more or less aristocratic schools lay above a thousand middle-class educational institutions variously endowed, including the hundreds of "grammar-schools" established in Tudor and early Stuart days. In 1865, the Schools Inquiry Commission led the way to the Endowed Schools Acts which have made like beneficial changes in the management of the public schools of the second class. During the last fifty years, the immense development of the middle class in our population, and the competitive examinations, have caused the rise of such large and flourishing new schools as Cheltenham, Clifton, Marlborough, Malvern, Wellington, Haileybury, Lancing, Radley, Leamington, Rossall, Brighton, and Bath; and the revival and vast increase of numbers on old foundations such as those which originated the City of London School, Manchester Grammar School, and the grammar-schools at Norwich, Taunton, Ipswich, Sherborne, Sedbergh, Birmingham, Leeds, Giggleswick, Christ's Hospital ("Blue-

coat School"), Tonbridge, Repton, Oundle, York, Bristol, Felstead, Bedford, Richmond (Yorkshire), Uppingham, Sheffield, Dulwich, Chigwell, Exeter, and Tavistock. The methods and subjects of instruction at the public schools of the second class, and at all the better private schools, have been greatly improved by the institution, in 1858, of the Oxford and Cambridge Local Middle-class Examinations, inspiring a healthy rivalry, and raising the standards of knowledge, of accuracy, and of power to put down on paper the mental impressions acquired by oral and by book teaching. Both the great old universities have also created examining-boards for the annual testing, at a moderate charge, of the proficiency of pupils at any school. Many of the Oxford and Cambridge colleges encourage students preparing for the Local Examinations by the award of scholarships and exhibitions, tenable at the university, to the most distinguished candidates. All who pass these Oxford and Cambridge "Locals" are arranged either in one of three Honour Lists, with indications of special distinction in any subject, or in a pass-list which implies, and is a certificate of, a fair degree of advance in school-work, English grammar, spelling, and arithmetic being "compulsory" subjects for passing. In the training of teachers, good work has been done by the College of Preceptors for the second-class schools, especially those conducted by private enterprise. This body, instituted in London and incorporated in 1849, gives courses of lectures on professional topics, and seeks to raise the standard of qualification for instructors in middle-class schools by the award, after examination in the theory and practice of teaching, of diplomas in the form of degrees as associate and licentiate. Both sexes have the advantage of this system, and about 3000 male and female teachers attend the half-yearly examinations established in 1854.

As regards the two ancient universities of England, we have already seen some workings in their midst of the modern spirit of reform. From narrow, exclusive, sectarian institutions they have, in a large degree, become national. They have long ceased to be regarded as mainly places of training for the clergy of the Established Church. Religious tests have disappeared, and the system of admitting to the educational advantages of the universities students not connected with any college or hall has greatly curtailed the cost of residence at these centres of learning. These

"unattached" or "non-collegiate" members began to exist in 1868, and in 1894 numbered 246 at Oxford, and 107 at Cambridge. The number of resident undergraduates at both universities has more than doubled in Victorian days, being now over 2900 at Cambridge, and nearly 3200 at Oxford. In the third year of the nineteenth century Oxford had an "Honour List" in classics, and her "Mathematical Honours" began about the same period, a "double-first" being taken by Mr. Robert Peel, afterwards Prime Minister, in 1808. Since the days of Newton, Cambridge had been famous for her mathematics, and the honour of being "Senior Wrangler" was one that brought renown. There were university prizes, in the shape of medals, for classical proficiency, but it was not till 1825 that the "Classical Tripos" was established, and that Greek and Latin became regular roads to college-fellowships and other offices of emolument and trust. Some years after the Reform Act of 1832, a demand for "university reform" arose, but it was not until 1850 and 1852 that Royal Commissions of inquiry began their work, in that order, for the universities of Oxford and Cambridge. Meanwhile, Cambridge, largely through the influence of her enlightened and able chancellor, the Prince Consort, and of her most distinguished resident graduate, Dr. Whewell, Master of Trinity, had been widening her range of study in establishing new "Triposes" or triple honour-lists, for law, natural science, and moral science. Oxford, for her part, had sought to conciliate aroused public feeling by creating schools and examinations of physical science, and of law and modern history in combination. In 1854, a great reform came at Oxford in largely increasing the number and value of scholarships for students, and in throwing these, along with fellowships, open to competition, instead of awarding them on the old system of local preferences and restrictions, because a man was born in a certain place or county, or was of "founder's kin"; or, worse still, of bestowing them, from sheer favouritism, on men devoid of all merit. Two years later, like educational reforms were introduced at Cambridge. Later reforms at both universities have made beneficial changes as to college-rule and management of the university revenues, and have abolished clerical fellowships and the restrictions on marriage for the holders of those rewards of ability and learning.

Of late years, the authorities at Oxford and Cambridge have

scholarships, and for one of the fellowships. This great institution has become the intellectual centre of the north of England, having a grand future before it in connection with medicine, and with science as applied to manufacturing and mining industries. The Yorkshire College at Leeds, and University College, Liverpool, are associated with Owens College to form the University. University College, Bristol, founded in 1876; Queen's College, Birmingham, incorporated by Act in 1867 for medical and theological studies; Mason's Science College, at Birmingham, already noticed; University College, Nottingham, mainly for scientific studies; and the Firth College at Sheffield, opened in 1879, are all testimonies to the power of the intellectual movement in the latter half of the nineteenth century. The Welsh colleges at Aberystwith, on Cardigan Bay, founded in 1872; at Bangor (1884), and at Cardiff (1883), are further illustrations of the modern advance towards the light. In addition to the faculties for medicine and surgery at the Universities and Colleges which have been named, and to the schools attached to the great London hospitals, there are now medical schools in connection with hospitals at most of the large English towns.

We have already seen something of the improvement made in the position of British women during the latter half of the Victorian age. We shall now note how the younger representatives of the sex have advanced in the way of intellectual training. In 1848, under the influence of Maurice, Kingsley, and other men of advanced views, Queen's College, in Harley Street, London, was instituted for the promotion of higher education among women, and received a royal charter in 1853. The establishment now includes a preparatory school and class for junior and backward pupils, and has nearly 400 students. The flourishing Ladies' College at Cheltenham, with about 500 students at the present day, arose in 1854. The University of Cambridge, in 1865, first recognized a duty in regard to female education by opening her Local Examinations to girls, and Oxford soon followed this good example. The famous Girton College, now containing 113 students, was opened, first at Hitchin, in 1869, and was transferred to Cambridge in 1873; Newnham College, at Cambridge, now educating 150 young ladies, followed in 1871. The University, ten years later, opened her honour examinations to these new *alumnae*, who quickly

and practical training at some medical school recognized by the profession. Hitherto, degrees had been open only to students at King's and University Colleges, or at one of about fifty other affiliated institutions of the kind throughout the kingdom. Within thirty years, the candidates for matriculation rose from about 300 to nearly ten times the number annually. By 1883, all the advantages of the University—examinations, degrees, exhibitions, scholarships, prizes, and medals—had been thrown open to women on precisely the same conditions as to men. The University of Durham was founded by an Act of 1832, and a royal charter of 1837 gave power to bestow degrees. The School of Medicine is fairly attended, and there are professorships and lectureships in classics, mathematics, Hebrew, and divinity at the two colleges, University and Bishop Hatfield's Hall. The Colleges of Medicine and of Physical Science at Newcastle-on-Tyne are affiliated with this modern university of the north.

The new Victoria University at Manchester had its origin in the munificence of John Owens, a cotton-spinner of the great town who, dying in 1846, left his fortune of nearly £100,000 to found a college which was to be absolutely free from all religious tests. In 1851, Owens College was opened with faculties in arts, science, law, and medicine. In 1873 new buildings were erected on a large scale through the aid of public subscriptions, and the institution, now on an enlarged and public basis, was incorporated by an Act, and, retaining the original founder's name, quickly showed its capacity for greater things. There were soon about 1000 students in attendance on the able lecturers appointed from Oxford, Cambridge, and London Universities. In 1874, a citizen of the United States, Mr. Charles Clifton, of Jersey City, bequeathed more than £20,000 to enlarge the department of engineering and mechanics, and in 1876 Mr. Charles Beyer of Manchester left the College by will £100,000. The sum of a quarter of a million was further gained by various legacies and subscriptions, and in 1880 the Victoria University began its career with a royal charter empowering the authorities to grant degrees, medicine and surgery being at first excepted. In 1883 this restriction was removed, and, in the same year, the Manchester and Salford College for Women was incorporated. Ladies enjoy the same advantages for study as the male students, with the right of competing for many of the prizes and

by about 7000 pupils. The good influence of this movement has gone far beyond its own immediate sphere of action, in raising the standard at private schools, and at institutions like the High Schools founded by local bodies. At the Crystal Palace, Sydenham, at Exeter, in Jersey, in North London, and elsewhere, "Ladies' Colleges", or "High Schools", or "Collegiate Schools", have been founded on a basis, and with results, vastly different from those presented by the "young ladies' academies" or "establishments" or "seminaries" of pre-Victorian days, which turned out samples of extreme ignorance in all that was really valuable, with a veneer of artificial, pretentious, and almost worthless "accomplishments". The Church Schools Company, a still more recent enterprise, has now 26 schools in operation for the benefit of those who are in communion with the Established Church in England.

Another sign of the times is the great development of scientific, artistic, and technical education. The Royal Academy School of Art in London belongs, in origin, to the last century, subsequently to the foundation of the Academy in 1768. The modern movement in favour of art instruction began with the establishment, in 1837, of a "Normal School of Design", with an art museum and lectures, according to the recommendation of a select committee of the Commons. The date of origin is very significant in its coincidence with the accession of Queen Victoria, whose husband, so highly cultured and so eager to improve the social condition of his adopted country, did more than any other man in high place to spread among the people a taste for art, which has now become an influential agent in elevating their habits and character, and has greatly improved the British manufactures which are connected with the arts of design. In 1851, the government grants to the London and provincial schools of design had reached the annual sum of £15,000, and a fair start had thus been made. Then a great impulse came with the pecuniary success of the Great Exhibition of 1851. A surplus of about £200,000 was left in the hands of the commissioners of management, and this great sum was well employed in the establishment of the public Department of Science and Art at South Kensington, and the erection of the South Kensington Museum which has so greatly aided the cause of education. The able and energetic Henry Cole, chairman of the Society of Arts, and one of the Great Exhibition Committee, was the founder

of the South Kensington Museum, of which he became Director in 1860. His invaluable services, continued till his death in 1882, were rewarded in 1875 by a K.C.B. The establishments at Kensington include a Normal School of Science, a National Art Training School, and the Royal School of Mines, and the Science and Art Department, now under the Committee of Council on Education, has a system of annual examinations, with prizes, scholarships, exhibitions, and Queen's medals, and makes grants to provincial schools of science and art for buildings and apparatus, with money rewards to teachers for the success of their pupils. A branch museum at Bethnal Green, in the east of London, has loan collections of pictures and other interesting objects for the benefit of the toilers in that great hive of humanity. The enormous development of these enterprises may be judged by the facts that, in 1893, 2550 science schools, with 180,000 students, and 1630 art schools and classes, attended by nearly 116,000 learners, were in connection with the Department, in addition to the classes for scientific and artistic education in ordinary schools. The excellent "Trustees' Academy" in Edinburgh, founded in 1760 by the Board of Manufactures, was attached to the South Kensington department in 1858, and in 1880 art instruction was established at Edinburgh University in the Watson-Gordon chair of Fine Art, founded by bequest of a brother and sister in memory of the president of the Royal Scottish Academy. The Dublin School of Art is also affiliated to South Kensington, and the Royal Hibernian Academy has classes for study from the life and the antique. The parliamentary vote for the aid of scientific and artistic instruction in 1856–7 was just under £65,000, increased in recent years about tenfold. The Slade Art Professorships at Oxford, Cambridge, and London Universities, founded in 1869, at a cost of £45,000, by bequest of Mr. Felix Slade, have done much to improve taste and knowledge, in matters connected with the fine arts, amongst the wealthier class of the community who can, by judicious and remunerative purchases, so greatly aid rising ability in this pursuit.

Only in the ninth decade of the nineteenth century was anything like due recognition given to technical education, or the special training of the young for trades and manufactures demanding manual skill for success, with the application of knowledge in various departments of science and art. In this respect, Great

Britain had fallen far behind France, Germany, and the United States, and in 1881 a Royal Commission was appointed to investigate and report upon the subject. Some attention had been already paid to the matter outside of any government department. The Livery Companies of London, in 1879, opened the Cowper Street Schools, and the following year saw the establishment of the City and Guilds of London Technical Institute, which now has two Technical Colleges, a Technical Art School, and a Leather Trades School, with a large staff of teachers, and nearly 1900 students. The Royal Commissioners made their report in 1884, highly praising the continental system, and in that year the Central Institute at South Kensington was erected at a cost of £100,000. Here students are trained for the business of architects, builders, and engineers in every branch, including the very important, swiftly-rising electrical department; and as decorative artists, and managers of chemical and other manufactories. The Technical Instruction Act of 1889 enables local authorities to levy a rate up to 1*d.* per pound for promoting technical or manual instruction. In Scotland, the Technical Schools Act of 1887 has the same object, and enables school-boards to provide tools and apparatus out of school funds or by loans specially raised. In many large towns of Great Britain there are now day and evening classes for the technical training of pupils from 13 to 18 years of age, and at Birmingham, Bradford, Huddersfield, Manchester, Newcastle-on-Tyne, Bristol, Sheffield, Southampton, and Glasgow, as well as in London, there are technical schools or colleges with laboratories well equipped for chemical, physical, mechanical, and engineering instruction and work. At Manchester, some of the board schools have adjacent workshops fitted with lathes and joiners' benches, in which classes of boys are taught to manipulate wood and iron. The excellent Central School at Sheffield prepares many hundreds of boys and girls, from 10 to 15 years of age, for the practical work of life in many trades, and in cookery, and needlework. In London, besides the Central Institute, there are three large private schools of electrical engineering. In the hope of rescuing agriculture from its depressed condition, we have, besides the new public department, with a special Minister, called the Board of Agriculture, special Colleges at Aspatria, near Carlisle, at Cirencester, in Gloucestershire, and at Downton, near Salisbury.

For political and social importance, all advances in education must yield to the revolutionary change which has come, during the latter half of the Victorian age, in popular or elementary instruction. We deal, in succession, with England and Wales, with Scotland, and with Ireland. In South Britain, we have already reported on this matter up to 1801. In the first decade of the century, Andrew Bell, an ex-chaplain of the Indian Army, and Joseph Lancaster, a Quaker, started schools for poor children on the monitorial system, by which elder pupils were employed, in default of adult instructors, to teach the rudiments to the younger. Lancasterian schools had rapidly spread, and, as the founder was a Nonconformist, the clergy of the Church of England, in jealous alarm, started, in 1811, the National Society for the Education of the Poor, with Bell, a Churchman, as superintendent of the system, which soon had some thousands of parish-schools at work. There was, however, a great lack of efficient teachers, and little real impression was at first made on the vast seething mass of ignorance and its concomitants, vice and crime. There was little public conscience yet aroused in connection with the matter. In 1808, the British and Foreign School Society had been established on Nonconformist principles, and its work was mainly confined to the towns, while the agency of the National Society pervaded the country districts. As time went on, these two Societies did really useful work among the labouring classes in teaching children to read and write, but a growing population ever outstripped their efforts, and the State held aloof from any recognition of a duty in regard to the mental and moral training of the humbler subjects of the Crown. In 1807, a scheme of Mr. Whitbread's for national education by means of schools in every parish had been thrown out by the House of Lords. In 1819, an essay by John Foster, a Baptist minister of great mental powers, *On the Evils of Popular Ignorance*, urging a national system of education, did something to stir the fears of statesmen and the philanthropy of the benevolent. Lord Brougham, always zealous in the cause, had obtained the inquiry known as "Brougham's Commission" in 1816, and an investigation spread over three years proved that in London at least 100,000 children, and half a million in all England, had no education whatever, while about 160,000 had only a weekly lesson at the Sunday-schools. Even then, the State would do nothing in the matter. Lord Melbourne "questioned the advantage

of general education"; a Bishop of Durham (peace to his ashes!) "believed that education was not likely to make its way among the poor", and a Bishop of Exeter said that if he, when he was rector of a parish, had started a school, the squire would have laughed in his face. At last, in 1833, Parliament voted £20,000 for elementary education, and placed the funds in the hands of the National and the British and Foreign School Societies. In 1839, this annual grant was raised to £30,000, and the Committee of the Privy Council on Education was formed. There was thus, for the first time, in the third year of Queen Victoria's reign, an education department of government, and a foundation of state-education was laid. The funds were now kept under state-control; inspectors were appointed over all schools assisted by public money; infant-schools were established, and a model school arose for the training of teachers. We cannot here trace the development of the system through the various Codes, and the method of "payment by results" devised by the acute and determined Mr. Robert Lowe (the late Lord Sherbrooke), who became Vice-President of the Education Board in 1859, and, three years later, produced his famous and much-contested "Revised Code", making one-third of the state-grant to schools payable according to the amount of attendance, and two-thirds by the result of examination conducted by the inspectors. The Elementary Education Act of 1870, carried through the Commons by Mr. W. E. Forster, as Vice-President of the Council, was the first full recognition of a public duty towards the children of the great mass of the labouring populations. The whole of the country is now covered with a network of school-districts, some under the management of school-boards, and others controlled by local committees. In April, 1893, England and Wales had 2331 school-boards in districts containing 18¾ millions of people, and 781 School-Attendance Committees, dealing with a population of 10¼ millions. Reading, writing, arithmetic, and (for boys) drawing, or (for girls) needlework, are compulsory subjects, the optional subjects including geography, science, history, singing, algebra, modern languages, and cookery. In board schools, the religious instruction is unsectarian, in voluntary schools, "dogma", or sectarian doctrine, may be taught. All children, in every class of society, are liable to compulsory education, and since 1891 education for the children of the poor has become practically free under a new

system of fee-grants. In June, 1893, about 19,500 schools were receiving this grant, and only 142 refused it. In August, 1892, England and Wales contained 4869 Board Schools, 11,935 National Society Schools, 530 Wesleyan, 967 Roman Catholic, 1333 British, undenominational, and other schools. The teachers numbered nearly 100,000, of whom about one-half were certificated, with 23,500 assistant-teachers, and nearly 27,000 pupil-teachers. There were 58 training colleges with nearly 4000 students, and the average attendance of children at the elementary schools, in the same year, reached nearly 4 millions, out of 6,700,000 children of school age, or between five and fourteen years, in all classes of the population in England and Wales.

The cause of popular education has been greatly served by the provision of books at a price which, in the earlier part of the century, would have appeared impossible. The removal of the paper-duty in 1861, and the application of steam to the printing-press, with other things conducive to cheap production, have been the main factors in this highly beneficial, civilizing change. As regards swiftness of printing in the present day, a single revolution of the cylinder in a modern press strikes off a sheet of 128 pages of a small octavo book with all its illustrative plates interspersed in the text. The book trade is now one of the most wonderful developments of manufacturing and artistic enterprise and skill. Edinburgh and London, towards the close of the eighteenth century, led the way in the cheapening of books, but at the close of the first quarter of the nineteenth, the volumes of a "cheap series" fetched 3*s.* 6*d.*, which would now sell at 1*s.* or even at half that amount. In 1827 the Society for Diffusing Useful Knowledge began to issue scientific treatises at a moderate price, published by that eminent pioneer of cheap literature, Charles Knight. There are now penny reprints of some English classics, sixpenny Shakespeares, and well-printed threepenny editions of other books. Those who desire to see the marvellous productions in school-books, for combined cheapness and excellence of typography and illustration, of the modern press in its latest developments, should consult the catalogues of Messrs. Nelson and Messrs. Chambers of Edinburgh, and of Messrs. Blackie of Glasgow, all of whom publish largely for the use of pupils at the elementary schools.

In Scotland, popular education had, at the beginning of the

nineteenth century, long been far in advance of the English standard. The famous statute of 1696 established a school in every parish at the cost of the landowners, and enabled the presbytery, or ecclesiastical court of every district, to enforce this very salutary law. In the Lowlands, due provision was thus made for the poor, but it was not till 1803 that a new statute dealt with the wants of remote Highland districts. The towns were supplied with education for the middle class by "burgh-schools" or "academies", coming between the parish-schools and the universities. Early in the nineteenth century, the Church made efforts to cope with a growing amount of ignorance in the towns. In 1833, government-grants began to aid training-schools for teachers, and in 1846 grants to the schools for children, and the system of inspection, were introduced on the plan established in England. In 1872, the Education Act founded a Scottish department, with a school board for each "burgh" or town, and for every parish or group of parishes, with compulsory attendance for all children between five and fourteen years of age. The boards, in Scotland, control both the elementary and the middle-class schools. In 1889, education was made free for the compulsory standards, that is, for all children learning the elementary subjects. A great advance has been made in popular education under these recent enactments. Since 1872, about 3½ millions sterling has been expended in providing new schools. In 1892, over 3000 day-schools were under government inspection, and the average attendance was nearly 540,000, out of about 850,000 children of school age in the whole country. There were 8250 certificated teachers, 3775 pupil-teachers, and 7 training-colleges with 860 students. Inspection has proved that the standard both of attendance and of attainments in the Scottish elementary schools is not below that of the best-instructed continental nations. Among the modern Scottish institutions for educational purposes are, at Edinburgh, the Heriot-Watt Technical College, a Science and Technical School, and Fettes College, this last being intended for higher-class education on the English model; at Glasgow, the Technical College, founded in 1886, and now having over 2000 students at its day and evening classes; St. Mungo's College, established in 1889, with faculties in law and medicine; the Free Church College, the High School, and the Glasgow and Kelvinside Academies; and at Dundee, University College, founded by Miss Baxter and opened

in 1883 for the instruction of both sexes in science, literature, and the fine arts, with an endowment of £100,000, and now having 250 students. Modern improvement has also dealt with the Scottish Universities. They always differed greatly from their English sisters, in being national and popular institutions, with students from every class, not subject to any academical discipline. They were higher schools for the people, doing much of the work performed in England by the middle-class endowed schools, and very valuable in raising the general intelligence and mental tone of the nation. Their great needs were a systematic course of study for all who chose to go through it, and a bestowal of degrees and honours in accordance with the results of regular examinations. In 1858, imperial legislation reformed the government of the universities, and established the system of the choice of a rector by the students, in accordance with which eminent English statesmen, scholars, and literary men have given many important annual addresses to the young enthusiasts who, often guided by political considerations, have honoured them by election. New courses of study were also arranged; degree examinations were instituted, and the increased influence and popularity of the universities has been demonstrated in the many endowments recently conferred by private munificence. At Edinburgh, the number of students has of late years greatly increased, and now the annual number matriculated exceeds 3000, of whom more than half are students in medicine, a faculty for which the university has long been justly renowned. At Glasgow, since 1870, the students have increased from under 1300 to over 2000, and the university is now well provided with "bursaries", exhibitions, scholarships, fellowships and other rewards of diligence and ability. At Aberdeen, the university, in its modern form, was established by the amalgamation of the old King's College and University with Marischal College and University. The students number about 750 in arts, divinity, medicine, and law.

In Ireland, the results of improved popular education have already been noticed. During the nineteenth century, the needs of higher education, and religious susceptibilities, have been met by the establishment, in 1854, of the Roman Catholic University, including University College, Dublin, and seven other Catholic Colleges; of the Royal University of Ireland, in 1880, an examining and degree-giving institution, like the London University; and by

the Queen's Colleges at Belfast, Galway, and Cork, founded in 1849. In the capital, much has been done for popular education by the National Board, the Church Education Society, and Catholic brotherhoods and sisterhoods. At Belfast there are Catholic and Methodist Colleges, the Royal Academical Institution, the Belfast Academy, over 130 National Schools, and the schools of the Church Educational Society. Elementary or popular education in Ireland is in the hands of a Board of Commissioners of National Education, controlling, in 1892, 8400 schools, with an average attendance of nearly half a million scholars, and annual grants from public money of nearly a million sterling. In 1893, the school-grants in England exceeded 5½ millions of pounds, and in Scotland reached £870,000. Up to 1880, the condition of middle-class education was very defective in Ireland. There were scarcely any good schools, except a few grammar-schools, mainly Protestant. The Irish Intermediate Education Board was accordingly formed, with members representing all the chief religious denominations, and furnished with funds to the amount of a million sterling, taken from the surplus-property of the disendowed Church of Ireland. Over 100 schools throughout the country were founded, and annual examinations are held in June at 120 centres, for pupils from 12 to 18 years of age, classed in four "grades", the whole number of subjects of examination representing the curriculum of a high-class school, in classics, English, French, German, Italian, Celtic or Irish, and mathematics. An extraordinary development of education has taken place under the stimulus of these competitions, where successful candidates gain rewards in the shape of 200 exhibitions of £15 per annum, tenable for three years; 50 of £25, tenable for two years; and 20 of £40, tenable for one year, with numerous prizes of valuable books, and special rewards of gold and silver medals, and £10 money-payments, for proficiency in particular subjects. Teachers receive substantial extra fees for the regular attendance of pupils.

On a general review of the advantages derived from the new modern system of state-education in elementary schools, now established in Great Britain for nearly a quarter of a century, we may safely assert that the large sums of money thus expended are producing a satisfactory return. The usual test of the signature of marriage-registers by the contracting parties, with their own names as written by themselves, or with a mark attested by the signature

of witnesses, shows the following facts. In 1843, in England and Wales, nearly 33 per cent of bridegrooms, and 49 per cent of brides, made their mark, as being professedly unable to write. In 1891, less than 6½ per cent of the men, and less than 7½ per cent of the women, were in that condition. In London, under 3¾ per cent of men, and only 5 per cent of women were, in the same year, on this test, unable to write their names. In Scotland, in 1890, under 4 per cent of men, and less than 6½ per cent of women, could not write, whereas, in 1857, the proportions were over 12 per cent and 24½ per cent for males and females respectively. In two counties of Scotland, Kinross-shire and Peebleshire, all the people married in 1890 signed their names, and, in Orkney and Banffshire, all the males did so. A still more gratifying proof of public benefit derived from education lies in the striking diminution in the numbers of young criminals. Jail after jail, as we have seen elsewhere, has been closed as useless, and these buildings erected for the punishment of crime formerly contained thousands of juvenile offenders, now consigned, but in hundreds instead of thousands, to separate and more suitable abodes, where reformation, and restoration to society as honest persons, are the objects steadily kept in view. We conclude with a brief account of a most significant event that occurred in the last month of the year 1893—an event well worthy of the last decade of the nineteenth century, and one that should alike warm the patriot's heart and strike dumb the pessimist who denies the patent facts of human progress. On December 13th of that fifty-seventh year of the Victorian age, on the site of the old Clerkenwell Prison, in London, more than two acres in extent, a Board school was formally opened by the Prince and Princess of Wales. The prison had disappeared because, from the great diminution of crime, its cells were no longer needed. The gloomy dead walls and sad associations of the structure which was the scene of the Fenian outrage perpetrated exactly twenty-six years previously, on December 13th, 1867, were now replaced by a beautiful building and a spacious playground destined for the mental, moral, and physical good of the children in a densely-populated quarter of the capital. The school-buildings cost over £40,000, and include 3 departments, for boys, girls, and infants, affording room for more than 2000 pupils. The establishment comprises a school for the blind, a

cookery-centre, a laundry-centre, and 12 class-rooms for the teaching of deaf children, and for the special instruction of those who are to some extent mentally slow and deficient.

CHAPTER XX.

SPORT.

Horse-racing—Steeple-chasing—Fox-hunting—Coursing—Deer and otter hunting—Shooting of game-birds—Angling. Salmon-fishing and grouse-shooting in Scotland—Deer-stalking. Billiards and chess.

An account of sporting, as distinguished from athletic sports, can scarcely be omitted in a record dealing with countries like Great Britain and Ireland. Horse-racing, an amusement which would commend itself more to good citizens if it could be freed from its vile accompaniments of betting, blacklegs, and general rascality and swindling, has been greatly developed in the period under review. At Chester, York, Doncaster, Epsom, Ascot and Newmarket, there was racing in earlier or in later Stuart times. The Goodwood meeting, on the Duke of Richmond's charming property near Chichester, was founded in 1802, and since then scores of new race-courses have been opened, down to Kempton Park, in south-west Middlesex, and Sandown Park, near Esher, in Surrey, which are among the most modern popular meetings. Of late years, the stakes have been greatly increased in value, the Sandown Park Eclipse Stakes, founded in 1886, sometimes exceeding £11,000 in value, while the Royal Stakes at Kempton Park, started in 1889, has reached nearly £10,000, and the Prince of Wales' Stakes, at Leicester, has been worth £11,000. The Portland Stakes at Leicester, and the famous old Derby Stakes at Epsom, and St. Leger, at Doncaster, are each worth about £5000. Among the curiosities of victory in these contests, we can only here mention that three important races, the *Two Thousand Guineas*, at Newmarket, the *Derby*, and the *St. Leger*, all for three-year-old horses, have been six times won by the same competitor, namely, by West Australian, in 1853; by the French horse Gladiateur in 1865, by Lord Lyon in 1866, Ormonde in 1886, Common in 1891, and Isinglass in 1893. The amusement has become, to

some extent, international, French horses, besides Gladiateur, having been often successful on the English turf, and English runners having carried off, again and again, the famous *Grand Prix de Paris*. A Hungarian horse, Kisber, won the *Derby* in 1876, and another Hungarian, Kincsem, carried off the Goodwood Cup two years later. It is claimed that the breeding of race-horses has done much to improve the general stock of hunters and carriage-horses; it is certain that, in these classes of animals, the British Isles can beat the world. We have here dealt with racing on the flat. The far bolder and more sportsmanlike steeple-chasing, over long cross-country courses that involve the leaping of hedges and ditches, and sometimes of considerable widths of water, had its rise in the present century, so far as England is concerned, though in Ireland, where it is still a favourite form of racing, it was practised in the latter half of the eighteenth century. About 1831 it began to be popular here, and in 1839 the "Grand National" race, over 4½ miles of country, was founded at Liverpool. This is the chief contest of the year; many other meetings are held, and it is a favourite sport with the fox-hunters, who often ride their own horses.

The old English sport of fox-hunting still greatly flourishes, some packs of hounds being maintained by noblemen and gentlemen at their own charges, others by subscriptions from those who join in the amusement. Melton Mowbray, Cheltenham, Rugby, and Leamington are great centres of the sport. In England there are about 160 packs of fox-hounds, with nearly 500 weekly "meets" during the season; a few packs are maintained in the south of Scotland, and also in Ireland. The sport has been carried by Englishmen to Canada, the Cape of Good Hope, New Zealand, and the north-west of India. A few packs of harriers are kept in England for chasing the hare on horseback, but the coursing of the animal with greyhounds is the favourite method. A club arose in Norfolk in 1776, and the nineteenth century saw the sport spread widely, especially after the passing of the statutes known as Game Laws, in 1828, 1831, and 1844. The preservation of hares from the hands of poachers made the animals more plentiful, and the public began to attend the meetings in large numbers. Good sport is found at Ashdown Park, in the west of Berkshire; at Amesbury, in Wiltshire; at Stockbridge, in Hampshire; at Lich-

field, Newmarket, and at Southminster, in Essex; the great meeting is that where greyhounds contend for the Waterloo Cup, at Altcar, in Lancashire, between Liverpool and Southport. In the north, the Border Union of coursing-men has a favourite meeting at Longtown, about ten miles north of Carlisle. After the passing, in 1880, of the Ground Game Act which allowed tenants to kill hares and rabbits on the land in their occupation, there was a considerable decrease in the number of hares, and inclosed courses were started, in imitation of the famous one formed in 1876 at Plumpton in Sussex. On these grounds, speed in the dog is the main qualification, as the hare has not the same chances of turning and dodging as on the open downs or fields. The chief meeting in this style is held in January at Kempton Park, sixteen miles west of London. The deer-hunting near London, with the royal buck-hounds, consists in chasing a tame fallow-deer let loose from a cart a quarter of an hour before the dogs and riders start in pursuit. The stag-hunting of the counties of Devon and Somerset, notably on Exmoor, is far more worthy of the name of sport, as it involves the chase, on horseback, over rocky high ground, and in bushy and fern-grown valleys, of the wild red-deer that there alone are still found in England, save in a few inclosed parks. There are a few packs of otter-hounds, for the extirpation, or the diminution, of an animal so destructive to fish. Shooting, in this country, is confined to rabbits and hares, partridges and pheasants, and pigeons let loose from a trap on inclosed ground, with from 25 to 30 yards distance allowed to the bird before firing. Before turning to Scotland and its famous sporting on moor and "forest", river and loch, we must note the great development in England of fishing in the form of angling in the rivers and in the lakes known as the Norfolk "Broads". Nearly every large town has its angling club, and artisans by thousands amuse themselves in the waters of the Thames, the Lea, the Trent, and other rivers, great and small, mostly with float-fishing, while wealthier amateurs have punts on every part of the upper Thames, or go yachting on the Broads to enjoy the sport, and catch trout with the fly in "preserved" waters. Of late years, it has been found needful to restock our rivers by pisciculture, an art largely developed in modern times by fecundating and hatching fish-eggs in artificial breeding-places. In Scotland this method has been largely practised for the increase of salmon

and trout, at Stormontfield, near Perth, on the river Tay, and at Howietoun, near Stirling.

Salmon-fishing in the Scottish rivers has of late years become a great source of sport to the wealthy, as well as remaining one of the national industries. The grouse-shooting on the moors both of Scotland and of Derbyshire and Yorkshire has been, with the same class, a highly-prized recreation since about the middle of the nineteenth century. In Scotland especially, large rents are derived from this source by owners of land, and it is computed that there are more than 2000 separate "shootings", Perthshire being the best-stocked county. Half a million brace have been shot in a good season, at a cost, it is said, to the renters of the land, of a sovereign per brace. The most exciting of Scottish sport is deer-stalking, wherein the wild red-deer are followed over miles of rough country until a shot can be obtained at the shy, suspicious, keen-scented game. The "deer-forests" of the Highlands cover an area of about two millions of acres, consisting of mountain-tops, corries or semicircular recesses in the hills, and moorland clad with heather and pasture. The term "forest" by no means implies the presence of much timber, but is used, in this connection, in the old legal sense of territory preserved and privileged for game. The development of this form of sport, for wealthy renters from the south, has been very great during the century, the number of deer-forests in Scotland having grown from a mere half-dozen to over one hundred.

We conclude with some reference to billiards and chess, which might more properly, perhaps, have been included in our list of "amusements". The increase of devotion to these games has been very great during the last fifty years, and in billiards, especially, the skill of professional players has become quite wonderful. The origin and date of invention are obscure, but as the india-rubber cushions, on the action of which so much depends, were not made until the reign of George the Fourth, the game, as now played, is really modern. No description of so familiar a thing is needed. The increase of delicacy in striking, knowledge of angles, and other requisites for success in scoring, may be judged from the fact that when the senior John Roberts, about 1855, was the champion of the world, having beaten the best players to be found on the Continent or in the United States, a "break", or continuous run of

scoring, which amounted to 200 was thought an excellent display, whereas his son, John Roberts of 1895, the best player, by far, on this side of the Atlantic, has made a break of over 1300, and constantly has runs of from 250 to about 700, in the "spot-barred" game, which precludes the player from sending the red ball from its spot at the top of the table into either of the adjacent pockets. This stroke has enabled Mr. Peall, the great "spot-stroke" professional, to score over 3000 in a single break. The very ancient game of chess had some good British players towards the close of the eighteenth century, and acquired a popularity which has steadily increased. England long held the highest position, and about the middle of the nineteenth century Mr. Howard Staunton, through his defeat of the famous French champion, St. Amant, was held to be the best player of his time. Chess has since then become not only largely international, but has made its way into almost every class of British society. London alone has above a score of clubs; the great provincial towns can show several in each; and few smaller towns are without an association for this intellectual recreation. Annual "tournaments" take place between representatives of Oxford and Cambridge Universities, and countless matches are played between the various clubs, while the British Chess Association, with its head-quarters in London, under the management of our greatest players, gives a national importance to the game.

CHAPTER XXI.

EXHIBITIONS.

Early exhibitions in Paris, in other European capitals, and in the United States—In Ireland and Great Britain—The Great Exhibition—The building and some of its contents—How Mr. Paxton worked out his design for the structure. Later Exhibitions in London—South Kensington Exhibitions—The Fisheries and Health Exhibitions, &c.—Exhibitions at Edinburgh, Manchester, and Glasgow—The Military, Naval, and Electrical Exhibitions—Relics of great men displayed.

The nineteenth century has been the first in the world's history that has been marked by great international shows of productions due to nature, science, and art. These displays, at once the proof and the stimulus of progress in manufactures and arts, had their

origin, according to good authorities, in a national exhibition held at Paris in 1798, followed by greatly extended shows of the same class at the French capital in 1802 and 1805. With slight interruptions, triennial displays, solely of French productions, were continued in Paris for about half a century. The example had speedy imitation abroad, and between 1820 and 1850 exhibitions of the same class were held at the capitals of all the chief European countries, and, beyond the Atlantic, at New York, Philadelphia, and other great towns. In the British Isles, Ireland can justly boast of the first highly meritorious display in this line, in the Exhibition of Irish Industries, held in 1829 by the Royal Dublin Society. The same association had several triennial shows, and the Society of Arts in London held a number of exhibitions that illustrated agriculture, manufactures, and commerce. Manchester, Liverpool, and Leeds had displays respectively dealing with the cotton manufacture; with foreign raw produce and shipbuilding; and with the preparation and textile industries of wool and flax. In 1849, the great Midland hardware town, Birmingham, gave a fine and well-arranged exhibition of her productions in various metals. It is almost needless to state that 1851 saw the first grand international display, known officially as the "Exhibition of the Works of Art and Industry of All Nations", and still popularly known as "The Great Exhibition". The main deviser and promoter of the scheme was, as all the world knows or should know, Prince Albert. Against great opposition and difficulties, the enterprise was carried out on a complete and magnificent scale, and achieved, in all points, a grand success. The numbers now quoted have been since often exceeded, but it was at that time a circumstance not only unprecedented, but unapproached, in modern history, for 92,000 human beings to be present at one time under one roof, as was the case, by calculation, in the Hyde Park building on October 7th, 1851. The whole number of visitors on that day nearly reached 110,000, the total during the continuance of the display, from May 1st to October 11th inclusive, exceeding 6 millions, while the whole receipts were above half a million sterling, and left a surplus, as we have seen, of £200,000. The structure, designed by Paxton, occupied a site of 19 acres, or seven times the area of St. Paul's Cathedral, and was placed in Hyde Park, London, near the spot where the beautiful memorial to the Prince Consort now stands. The building was

1851 feet long, and 408 wide, the centre transept, with a curved roof, rising to a height of 108 feet, giving great additional effect, and allowing the preservation of two fine elms. Opened by the Queen, with a spectacle of imposing splendour, amidst a flood of sunlight pouring in through the transept's colossal glittering arch, the Great Exhibition, in a first sight of its countless beautiful and ingenious works sent from every quarter of the world, with all their rich variety of form and colour, produced an effect of wonder and delight that could never die away from the remembrance of the spectator. The building was happily named the "Crystal Palace", since transferred with the same structure, in a somewhat different form, to the heights of Sydenham, in Kent. The wonder of wonders was the building itself, concerning which, and its author, Charles Reade has well written that "it is one great characteristic of genius to do great things with little things", and that Paxton, able to see "that so small a matter as a greenhouse could be dilated into a crystal palace, with two common materials—glass and iron—raised the palace of the genii; the brightest idea and the noblest ornament added to Europe in this century". For the benefit of readers who visited the wondrous display, and may like to be reminded of old favourites, we may mention some of the objects that attracted most admiration. In the central transept, the Crystal Fountain, a large glass fabric made by Osler, of Birmingham, was extremely effective and beautiful, cooling the air with its abundant jets of water, and forming a much-used meeting-point for visitors. The chaste and elegant iron gates from Coalbrookdale Foundry, in Shropshire, formed another fine feature in the same prominent position. Near the end of the eastern nave, crowds of visitors gathered round the white marble Greek Slave of the American sculptor, Hiram Powers of Vermont. The Fine Arts Court contained the beautiful and natural little models in wax, by a Mexican named Montanari, of Indians engaged in various occupations and sports. It was often difficult, from the crowd gathered around, to obtain a good view of De la Rue & Company's ingenious machine for folding envelopes at the rate of nearly 4000 per hour. The Kenilworth Buffet, carved out of the wood of a famous oak near the Castle, was finely sculptured in relievo with scenes illustrative of the great Tudor queen's visit to the Earl of Leicester. The grand malachite doors, in the Russian department, were purchased by an English gentleman, Mr. Hope,

for the sum of 10,000 guineas. The Great Western Company's railway-engine, *Lord of the Isles*, constructed at Swindon, working with 1000 horse-power, and weighing, with the tender, water, and coals, nearly 53 tons, was the finest locomotive up to that time produced. Built for the broad-gauge line, this engine, after many years' service with express passenger trains, was still working, in 1888, in the goods traffic of the company. We may note, in passing, and with regard to another and a chief section of this work, that Canada displayed many specimens of iron, zinc, lead, copper, silver, and some gold, with various grains, maple-sugar, flax, and hemp; planks of pine and birch, maple and walnut, and many other woods; and furs and skins of her wild animals. The British West Indies sent samples of produce, and Mauritius showed some exquisite bouquets of imitation flowers, wholly made from sea-shells. From New South Wales came wool, timber, and skins, and the department of South Australia had many specimens of copper ore from the famous Burra-Burra mines, then in full richness of production. The velvets of Italy; the carpets, the Sèvres porcelain, and Gobelin tapestry of France, were held, by all competent viewers, to be matchless. The Koh-i-nur (Kohinoor) or "Mountain of Light", as Nadir Shah, the Persian captor of Delhi, in the days of the "Great Mogul", called the wondrous gem, in his first start of surprise at its size and splendour, was one of the most popular objects in the show. After being placed among the treasures of Lahore, it came, on our annexation of the Punjab, in 1849, into the charge of the governor-general, Lord Dalhousie, and was sent by him to the Queen in 1850. At the close of the Great Exhibition, it was reduced in size, by re-cutting, from 186 carats (nearly 1¼ oz. Troy weight) to 106, and is now frequently worn, set as a brooch, by the Queen. We return to the subject of the building, the construction of which, considered in all its circumstances, represents a triumph of British energy, resources, and skill. It was on June 18th, 1850, an anniversary of victory that augured well for a new enterprise, that Mr. Paxton, sitting at Derby as chairman of a Midland Railway committee, for the trial of an offending "pointsman", paid no heed whatever to the business in hand, but jotted down on a fair white sheet of blotting-paper his rough sketch of a design for the great structure. His colleagues believed him to be making careful notes of the evidence,

but he explained to them that he already knew all about the pointsman's case, and had been otherwise employing his time. On that evening, the blotting-paper plan was in Paxton's office at Chatsworth. Ten days later, his clerks had completed elevations, sections, working details, and specifications ready for the inspection of a contractor, and the designer, with his plans, just caught the London train at Derby, on the day before the royal commissioners were to meet. His only companion in the carriage, by good fortune, was Robert Stephenson, the eminent engineer, a member of the commission. To him Paxton handed the roll of plans, and, eating his dinner from a paper package of sandwiches, he observed in silence the face of his friend as he scanned drawing after drawing while he smoked a cigar. Not a sign of pleasure or surprise appeared in Stephenson s face or manner, as the smoke rose up in regular wreaths, and sheet after sheet was laid aside on the seat. The cigar-smoke grew fainter and more intermittent; the cigar went out, but, for twenty minutes, wholly unobservant of the fact, the son of George Stephenson puffed away at the useless weed, and the hopes of Paxton rose high as he watched. At length judgment was given in the words, "Wonderful! worthy of the magnificence of Chatsworth! A thousand times better than anything that has been brought before us!" The building committee had already devised a plan of their own, but Paxton had his design published in the *Illustrated London News*, and public opinion was strongly aroused in his favour. An interview with Prince Albert induced the ingenious and persevering designer to procure a tender from a firm of contractors. From Buckingham Palace he went straight to the offices of Messrs. Fox & Henderson in Spring Gardens, near Charing Cross. They jumped at the chance offered them by the fact that the building committee, in advertising for tenders for their own design, had invited contractors to suggest improvements therein. It was impossible, however, to estimate the expense of a building composed of iron and glass on so vast a scale, without consulting the great manufacturers of the north and Midlands of England. By telegraph the right men were summoned to London; the makers of glass and of iron-work furnished their several estimates to the tender for the whole work; and within a week the contractors had prepared every working-drawing in detail, and had calculated the cost of every pound of iron, of every cubic inch

of wood, and of every pane of glass. Such was the origin of the building which Thackeray's verse described as "A palace as for fairy prince, A rare pavilion such as man Saw never, since mankind began, And built and glazed!", and which, in prosaic fact, contained 900,000 square feet of sheet-glass, weighing over 400 tons, in panes 49 inches long, the largest ever made; 3300 cast-iron columns, from 14½ feet to 20 feet in length; 34 miles of guttering tube, joining the hollow columns, which were also drain-pipes for rain-water from the roof, in complete connection underground; 2224 girders, some of wrought iron; 1128 bearers for the support of galleries; 205 miles length of wooden sash-bar; millions of square feet of flooring, and enormous quantities of wooden railing and partition. The edifice was erected in the space of little more than four months. On the first four days of the week, when the payment was a shilling for admission, large companies of artisans, village-labourers, school-children, and even, in some cases, paupers from unions, were brought to see, at the first great "World's Fair" of history, the productions of nature and man in every clime, and to view the garb, and listen to the speech, of men of divers nations and peoples and tongues.

The second International Exhibition held in London was opened on May 1st, 1862, in a vast building of brickwork, covering about 24 acres of ground, erected at South Kensington, with two immense cupolas, and some annexes made of glass, iron and wood. The occasion was overshadowed by the public gloom of grief arising from the recent death of the Prince Consort, who had been devoting his later period of life to the arrangements. The structure had none of the novelty or charm attaching to the Crystal Palace of 1851, but the display was very extensive, instructive, and delightful. The British colonial department showed a great advance upon the previous Exhibition, one of the most striking objects being a huge gilded obelisk, representing the bulk of the gold, in value exceeding 80 millions sterling, obtained from the mines of the Australian colony, Victoria. There was a very large display of art-productions in oil and water-colours, engravings and etchings, architectural drawings, and sculpture, which enabled countless British visitors to form a first acquaintance with the merits of many eminent living foreign artists. Over six millions of persons in all entered the building in the six months that it

remained open. The financial result strikingly displayed the cheapness of Paxton's materials compared with brick. The cost of the South Kensington building was £320,000, as against £170,000 for the Hyde Park structure, the figures in both cases representing the charge for use and waste only. Other expenses, in 1862, caused a deficit of about £10,000 on receipts that amounted to nearly £450,000. It was observed that, since 1851, rifled cannon and muskets, and armour-plating for ships of war, had come into use, and that a great development had taken place in porcelain and glass, iron, paper, jewellery, furniture, and machinery, photography, and the electric telegraph. The building was afterwards almost wholly removed. In 1871 and the three following years, international exhibitions of fine arts and industry were held in buildings erected at the Horticultural Society's gardens at South Kensington, on part of the site of the show of 1862, but they aroused only an interest that yearly declined.

In 1883, South Kensington saw the beginning of a series of exhibitions on a new plan which quickly gained the public approval, the instructive part of the proceedings being wisely supplemented by a purely amusing element in the shape of the beautiful gardens of the Horticultural Society, where visitors, on stepping outside the building, could enjoy fountains and promenades, bands of music and, at night, tasteful and brilliant illuminations with coloured lamps and the newly-risen electric light. The articles exhibited at the shows of 1883 to 1886 inclusive were confined to special departments of progress, and the public favour won was largely due to the possibility afforded of gaining, without weariness, a real and fairly complete knowledge of what was presented to the eye and the mind. In 1883, the Fisheries Exhibition showed all that belongs to a most important industry which has, besides its intrinsic value, an adventurous element of endurance and peril. The Health Exhibition of 1884, styled by popular, kindly-meant wit, "The Healtheries", was of great interest and value in displaying the sanitary improvements and inventions which had by this time, as we have seen, taken a firm hold of the public mind. The Exhibition of Inventions, in 1885, needs no comment. The Colonial and Indian Exhibition of 1886, by far the most beautiful and interesting, to the general public, of the whole series, will be elsewhere noticed. It attracted over 5½ millions of visitors. In

1886, 2¾ millions of persons inspected the Edinburgh International Exhibition of Industry, Science, and Arts. The year of the Queen's jubilee, 1887, was marked by a show of Arts and Manufactures at Manchester, which was visited by 4¾ millions of persons, and in the following year a great International Exhibition of Industry, Science, and Art at Glasgow attracted 5¾ millions.

In three successive years, 1890, '91, '92, there were given, in London, the interesting and valuable special displays known as the Military, Naval, and Electrical Exhibitions, the two former being held in the grounds of the Royal Military Hospital at Chelsea, and the last at the Crystal Palace. The Military and Naval Exhibitions contained many thousands of industrial objects employed in every department of the services, and historic loan collections of pictures and of relics connected with our civil and foreign wars. Not without entrancing interest could the British visitor behold such objects as swords from the battlefields of Naseby and Killiecrankie; the sash worn by Wolfe when he fell at Quebec; the sword worn by Tippoo Sahib at the storming of Seringapatam, with the ring taken from his finger, after death, by "Colonel the Hon. Arthur Wellesley"; the keys of Corunna gate, brought away by a British officer after the battle; the sword of Sir John Moore; a pair of pistols carried by Wellington through the Peninsular War; Luke Clennel's fine picture of the Life-Guards' Charge at Waterloo; the sword once worn by Mourad Bey, chief of the Mamelukes, taken by Blücher's cavalry from Napoleon's carriage after Waterloo, and presented to Wellington; part of the bridle of Wellington's charger "Copenhagen", worn on the great day; the silver plate used by Napoleon at breakfast before the battle; the Duke's sword, cockade, and cloak, worn at Waterloo; the telescope and field-glass which he used during the fight; the yellow damask cushion placed under Napoleon's head, as he lay dead at St. Helena while the British regiment in charge passed through the room; the silver spurs taken from Picton's boots after his death in the great battle; the leather jacket worn by General Sir Charles Napier at the battle of Meeanee, in 1843; a piece of rock from the precise spot, between Gandamuck and Jellalabad, in Afghanistan, where the last remnant of our troops were massacred in January, 1842; a triple picture, taken from Prince Menschikoff's carriage after our victory at the Alma; the cloak and wallet of Captain Nolan, the

first man killed in the "Charge of the Light Brigade"; the sabretasche of Sir Colin Campbell (Lord Clyde), perforated by a brass Russian bullet as he led his Highlanders up the Alma heights; the old King of Delhi's sword, taken after the capture of the town by our troops in 1857; a part of Nana Sahib's flag; a brigade order-book of the 78th Highlanders during the siege of Lucknow by the Sepoy mutineers in 1857, with writing done in powder and water, instead of ink; written messages conveyed in quills from outside to the beleaguered garrison of Lucknow; the gun used by Colonel Burnaby at the battle of El Teb; flags taken by Gordon from the Taeping rebels; the Empress of China's dressing-gown, a part of the Emperor's throne, and a watch, taken from the Summer Palace at Pekin; assegais of the Zulu king, Cetewayo; a gold grotesque mask, taken from the Ashantee king's palace at Coomassie, in 1874; a sketch of Napoleon, taken a few hours after death by Captain Marryat, and a view of Napoleon's residence at Longwood, done by the same hand in 1819; the sword and badges worn by Napoleon at Waterloo; and the sword worn there by Marshal Ney. Such were some of the interesting objects in the Military Exhibition. At the Naval, exact reproductions of the Eddystone Lighthouse and of the *Victory*, at Trafalgar, were among the matters shown outside the building, while the cases of relics, besides countless autographs and letters of eminent naval commanders from Elizabeth's days to the Victorian age, showed the log-book of Captain Cook's vessel, the *Endeavour*; a box made from the wood of the cask in which Nelson's body was brought home; the sword presented to Lord Howe, on board the *Queen Charlotte*, by George the Third, after the victory of the "glorious First of June", 1794; swords worn by officers at the Nile and Trafalgar; a silver dress dirk worn by Nelson; the china-basin of Nelson's breakfast-set on the *Victory*, broken during the battle, and repaired by the care of one of his midshipmen; the *Victory's* silk boat-flag; the hat worn by Nelson at the Nile; locks of the hero's hair; his arm-chair in the *Victory's* cabin, shattered by a round-shot in the battle of Trafalgar, and now held together by iron framework; a bottle of port from his wine-cellaret on the *Victory*; relics from the *Royal George*, sunk at Spithead in 1782; piece of lining of the *Victory's* fore-topsail as she went into action at Trafalgar, torn by shot and stained with blood; a green silk

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breech-loading system, after a reversion to muzzle-loaders, was finally adopted for heavy guns. As regards weight of shot, the 68-pound ball fired from the 95-cwt. smooth-bore of 1840–1860 has been superseded by shell and Palliser chilled shot rising from 100 lbs. weight in 5-ton guns to 1250 lbs. in 67-tonners, and 1800 lbs. in cannon of 110 tons. The Nordenfelt, Hotchkiss, and Gardner quick-firing and machine guns were introduced into the navy in and after 1880. The Electrical Exhibition was a wonderful and beautiful display of the advances so swiftly made in electric lighting.

END OF VOL. III.

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